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Vol. 16
1931

THE NEW YORK BOTANICAL GARDEN
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ADDISONIA

COLORED ILLUSTRATIONS
AND
POPULAR DESCRIPTIONS
OF
PLANTS

VOLUME 16
1931

PUBLISHED BY
THE NEW YORK BOTANICAL GARDEN
(ADDISON BROWN FUND)

D35
Vol.16
1931

THE SCIENCE PRESS
PRINTING COMPANY
LANCASTER, PA.

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MARCH, 1931

PUBLISHED BY

THE NEW YORK BOTANICAL GARDEN

(ADDISON BROWN FUND)

JUNE 9, 1931

ANNOUNCEMENT

A bequest made to the New York Botanical Garden by its late President, Judge Addison Brown, established the

ADDISON BROWN FUND

"the income and accumulations from which shall be applied to the founding and publication, as soon as practicable, and to the maintenance (aided by subscriptions therefor), of a high-class magazine bearing my name, devoted exclusively to the illustration by colored plates of the plants of the United States and its territorial possessions, and of other plants flowering in said Garden or its conservatories; with suitable descriptions in popular language, and any desirable notes and synonymy, and a brief statement of the known properties and uses of the plants illustrated."

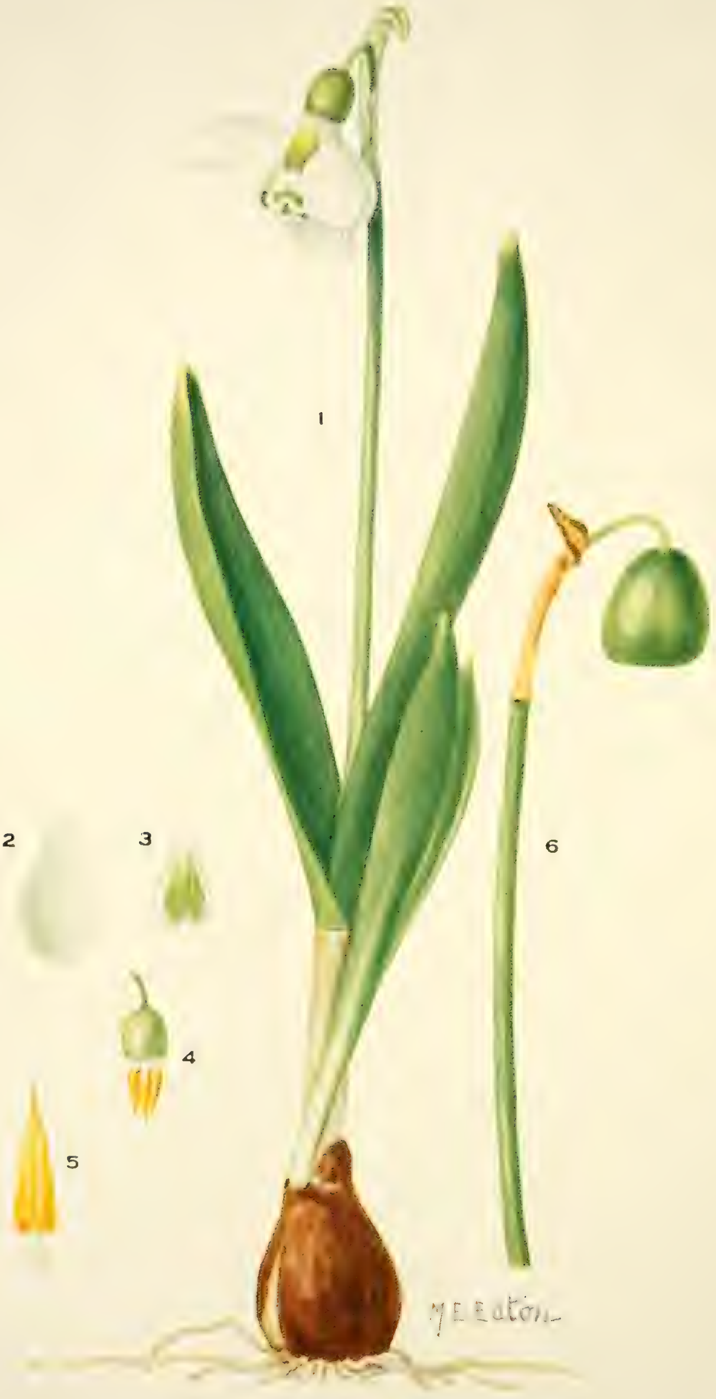
The preparation and publication of the work have been referred to Mr. Edward Johnston Alexander, Assistant Curator, and Mr. Kenneth Rowland Boynton, Head Gardener.

ADDISONIA is published as a quarterly magazine, in March, June, September, and December. Each part consists of eight colored plates with accompanying letterpress. The subscription price is $10 annually, four parts constituting a volume. The parts will not be sold separately.

Address:

THE NEW YORK BOTANICAL GARDEN
BRONX PARK
NEW YORK CITY

Subscribers are advised to bind each volume of ADDISONIA as completed, in order to avoid possible loss or misplacement of the parts; nearly the whole remainder of the edition of Volumes 1 to 15 has been made up into complete volumes, and but few separate parts can be supplied.



GALANTHUS FOSTERI

NEW YORK
BOTANICAL
GARDEN

(Plate 513)

GALANTHUS FOSTERI

Foster's Giant Snowdrop

Native of the Mountains of Asia Minor

Family Amaryllidaceae — Amaryllis Family

Galanthus Fosteri Baker, Gard. Chron. III. 5: 458. 1889.

Galanthus nivalis or common snowdrop, the first flower of the year, is general in central and southern Europe.

With the New Year in many sheltered nooks in garden and copse the green and white buds begin to push their way up through the crackling brown leaves which cover the ground, and even a covering of snow does not hinder them from making an appearance.

NOTICE

The pages of the first two numbers of Addisonia, Volume 16, were numbered from 73 to 104. This was in error, and should have been from 1 to 32.

tions three kinds of snowdrops, calling them all "Bulbus Violets." Two of these are now known as Snowflakes.

The Giant Snowdrop, *Galanthus Fosteri,* here illustrated, is from Asia Minor. It was introduced to horticulture about 1889 by Sir Michael Foster, whose name it now bears. It differs mostly from the common snowdrop in having a larger bulb, broader and incurved leaves, also larger and more globose flowers.

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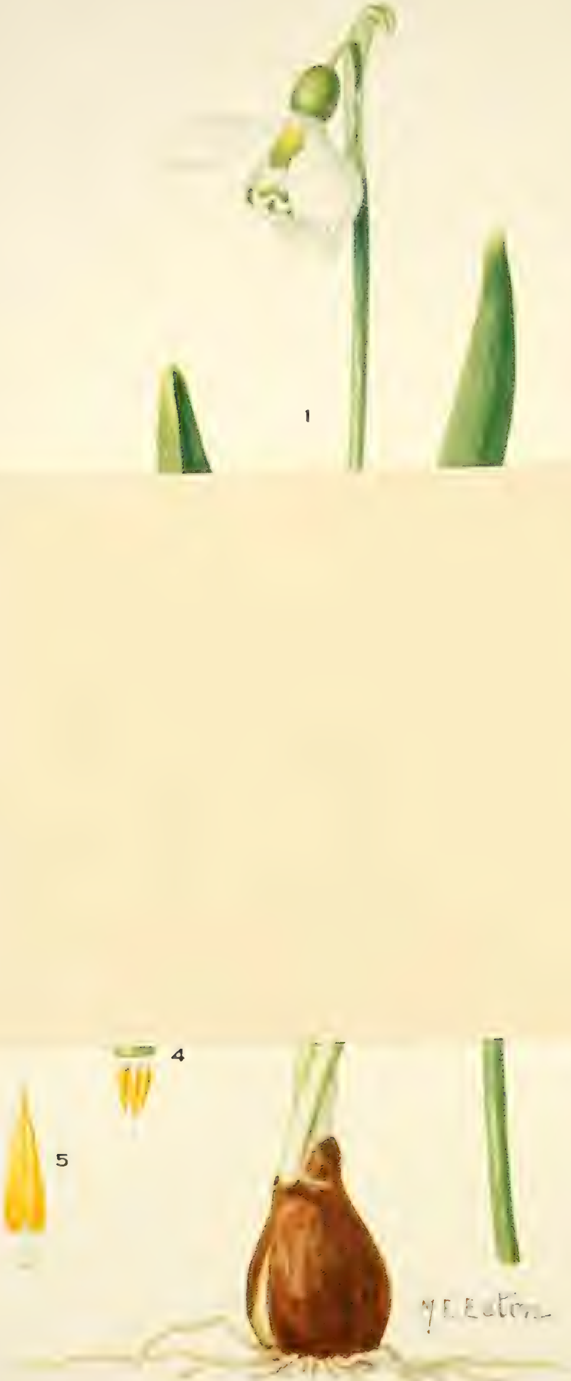

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With the New Year in many sheltered nooks in garden and copse the green and white buds begin to push their way up through the crackling brown leaves which cover the ground, and even a covering of snow does not hinder them from making an appearance. Thus they live up to their French name of "*Perce-neige*" and the English "Snowdrop" and the German "*Schneeglöckchen*" are also appropriate. An old name in England was "Fair Maid of February" and was most likely given to the plant by the monks to whom it was an emblem of feminine purity and by whom it was probably introduced; though there are many woods, thickets, lanes and orchards where it grows without culture, apparently or almost certainly wild.

The Snowdrop was dedicated to the Virgin and has associations with Candlemas Day, February 2. There is an old, old legend that Eve was so grieved at the quick melting of a snowfall, that, to console her, drifts of snowdrops were sent to replace the snow. Another version is that after the fall of Adam a driving snowstorm swept the Garden of Eden. An angel, who had been sent to comfort Eve caught a single flake as it fell, breathed on it and bade it blossom. Before it reached the ground it had changed to a beautiful flower; this Eve cherished above all other flowers of the garden.

Bulbous Violet is another very old name. Gerarde in 1597 mentions three kinds of snowdrops, calling them all "Bulbus Violets." Two of these are now known as Snowflakes.

The Giant Snowdrop, *Galanthus Fosteri,* here illustrated, is from Asia Minor. It was introduced to horticulture about 1889 by Sir Michael Foster, whose name it now bears. It differs mostly from the common snowdrop in having a larger bulb, broader and incurved leaves, also larger and more globose flowers.

JUN 19 1939

This species is now thought to be a natural hybrid between *G. Elwesii* and *G. latifolius,* as it has the wide, bright green leaves of the latter, and the type of flowers of the former.

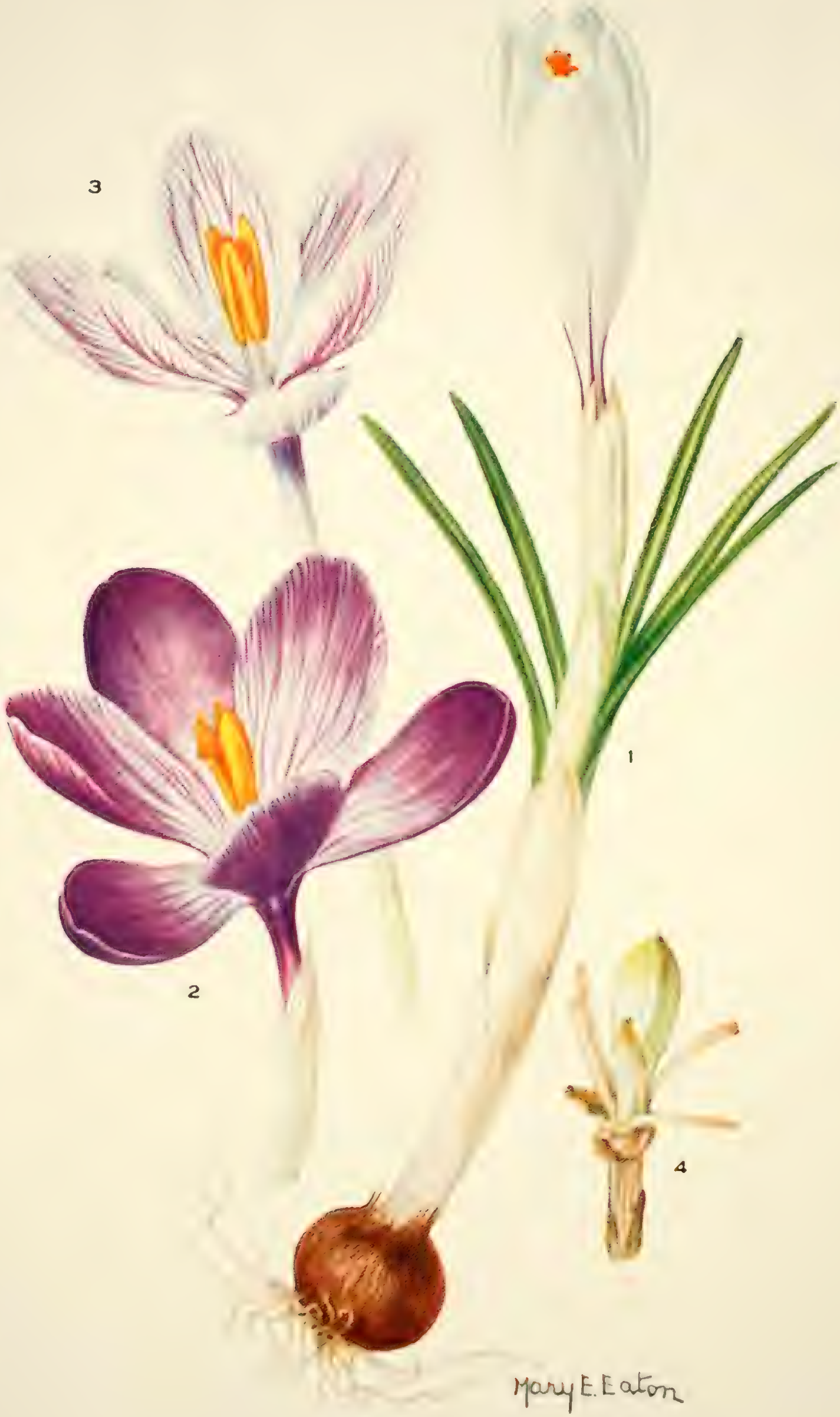
Snowdrops are most effective when grown in large clumps and care should be taken not to disturb the bulbs. In congenial, cool and shady spots the bulbs increase quickly and form beds from which hundreds of flowers may be picked. They look particularly well when in large clumps under shrubs and evergreens or when starring grassy slopes. Snowdrops will grow almost anywhere but thrive only in light soil with plenty of leaf mold, and they prefer a shady and sheltered situation.

Galanthus is from the Greek Gala-anthos—milk-flower, in allusion to the milky whiteness of the flower.

Foster's giant snowdrop is an acaulescent herb arising from a tunicate bulb the outer coat of which is a dry brown skin. The leaves, usually two in number, are lorate with a hardened, bluntly-incurved tip, bright green, five to six inches long, are enclosed in a colorless sheath for their lower third. The flower-scape is solid, somewhat over-topping the leaves, bearing at its summit a solitary flower at first enclosed in a two-cleft spathe, but finally by the splitting of the spathe the bud is exserted on a nodding pedicel. The flower is about one inch long. The perianth is white, the three outer segments short-clawed with an orbicular elliptic blade, the tip rounded; the three inner segments emarginate, half the length of the outer, connivent below, the tips free, the inner side green, the outer side with a green blotch on the lower portion and green markings on either side of the sinus, which become confluent below. The stamens are six in number, orange-yellow, about one-fourth inch long. The filaments are white about one-fourth the length of the anthers. The anthers are two-celled, lanceolate, opening by terminal pores. The stigma is small and capitate. The style is slender, longer than the stamens. The ovary is inferior, nearly globose, with many ovules. The fruit is an obovoid fleshy, three-valved capsule.

MARY E. EATON.

EXPLANATION OF PLATE. Fig. 1.—Plant in flower. Fig. 2.—An outer perianth division. Fig. 3.—An inner perianth division. Fig. 4.—Perianth removed to show stamens and protruding style. Fig. 5.—An enlarged stamen. Fig. 6.—The capsule.



CROCUS VERNUS

(Plate 514)

CROCUS VERNUS

Spring Crocus

Native of Europe, in the Mountains

Family IRIDACEAE IRIS Family

Crocus vernus **All. Fl. Pedem. 1: 84. 1785.**

The earliest crocus is a yellow type, *C. Susianus,* known as Cloth-of-Gold, appearing from the middle to the end of March. It is a native of the Crimea, orange with the outside of the petals coated with brown. There is another yellow crocus, coming later, known as the Dutch crocus, or the golden yellow and mammoth golden yellow, derived from *C. Moesiacus* or *C. aureus.* The white, striped and purple crocuses in cultivation belong usually to *C. vernus.* Caroline Chisholm, Mont Blanc, King of the Whites, Queen of the Netherlands, are all white forms. Purple forms grown are Baron von Brunow, David Rizzio, *purpurea grandiflora.* White striped with violet is represented by Sir Walter Scott and La Majesteuse. White striped with lavender is Mme. Mina. These are the common garden crocuses.

Crocus bulbs should be planted two to three inches apart, or sixteen to thirty-five to the square foot, when a part of the regular garden. If for the lawn, place them in a shovel or other receptacle and scatter them, planting where they drop. This avoids the set-stiff effect which is apt to follow other methods of planting.

As regards indoor blooming, a crocus has been known to flower extremely well without being attached to a particle of soil. Occasionally one left outside the soil after planting outdoors has lain until spring and there flowered without roots. The bulb was well ripened, stored full of nourishment, and from the bulb the flower was drawn by the spring warmth and sunshine. *Crocus speciosus,* a fall blooming kind, can be brought into bloom indoors in a few weeks without soil, and with very little more than some medium of support to hold it up. Crocuses and scillas are best planted in shallow bowls, about two inches high; they can be grown in sand or in bulb-fibre or peat moss. Hyacinths, tulips and daffodils need deeper bowls, and will grow in the above media or in a good garden loam.

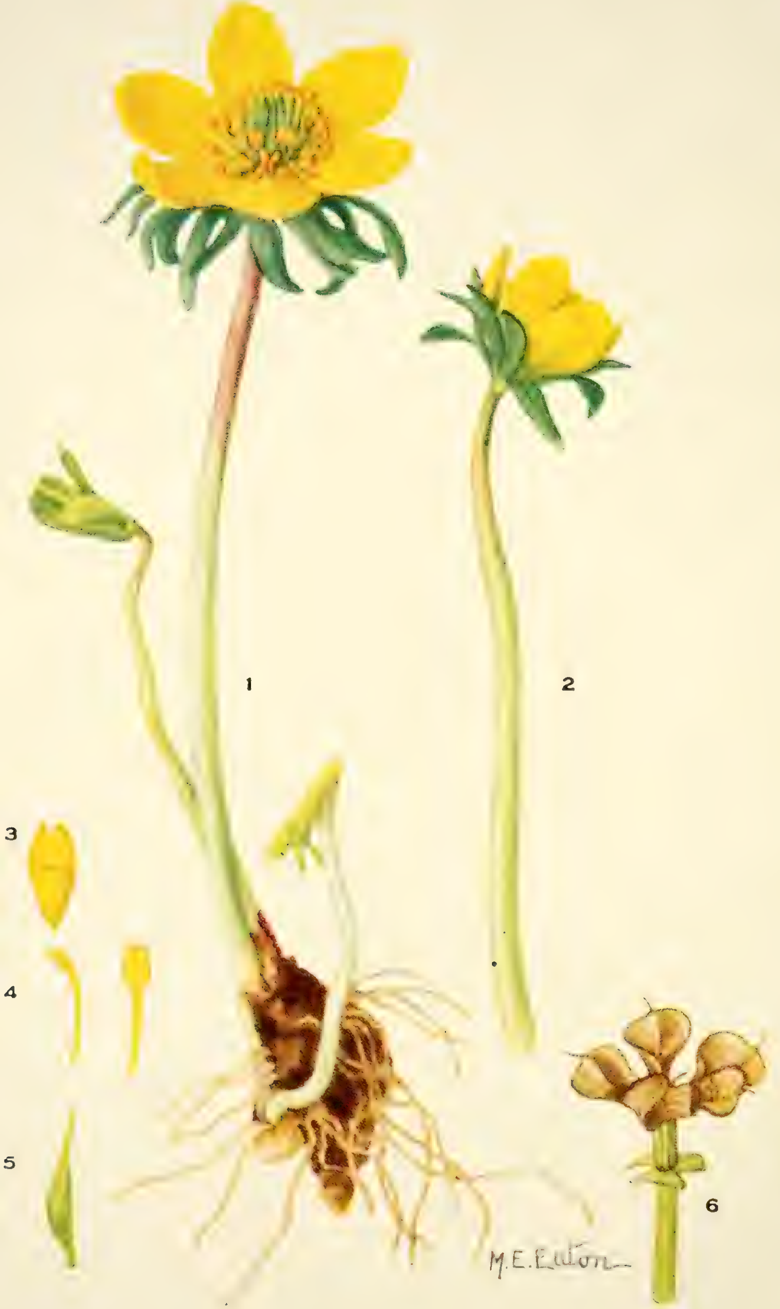
The crocuses of Plate 514 were illustrated from flowers blooming in the plantation of small bulbs started in the Pinetum of the New

York Botanical Garden in 1928. Under the patronage and direction of Mrs. Wheeler H. Peckham, some 75,000 bulbs were naturalized on the grassy slopes around the Japanese black, Japanese Red, Austrian and Himalayan white pines, and there they make the first important floral display of spring.

The crocus blooms from a corm three quarters of an inch thick, rather more broad than tall, larger under cultivation, with a fibrous brown, reticulated coat. The leaves, three or four, appearing with the flowers at blooming time and equalling the flower stem, are smooth, keeled, with a white stripe down the center. They are ten to twelve inches long, one-third of an inch wide. The flowers are goblet-shaped, with tubes two to three inches long and bearded at the throat, white inside. The six perianth segments are one to two inches long and two-thirds of an inch wide, white to purple and variously striped; the three outer somewhat different from the three inner in shape and markings. The anthers are orange, the filaments white. The stigma is three branched, orange and feathery, exceeding the stamens. The seed pods form at or below the surface of the soil and are forced up between the leaves after the flower dies. They then lengthen their stalks and ripen on the surface of the ground, opening and leaving many brown seeds.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Plant and flower of a white variety. Fig. 2.—Flower of a purple variety. Fig. 3.—Flower of a striped variety. Fig. 4.—Seed pod.



ERANTHIS TUBERGENII

(Plate 515)

ERANTHIS TUBERGENII

Van Tubergen's Winter Aconite

Horticultural Origin

Family RANUNCULACEAE BUTTERCUP Family

Eranthis Tubergenii Hort.

Some of the earliest bloomers in rockeries and gardens are the Amur *Adonis,* with its double greenish flowers, and the forms of Christmas rose, *Helleborus niger,* and *Helleborus viridis.* The winter aconite, *Eranthis,* should bloom before these, or at the same time. The common form, *E. hyemalis,* a low herb, from the mountains of Europe and Asia, is historically a stunted, winter-bloomer, noted for early yellow flowers surrounded by a whorl of shiny green leaves.

Planted under deciduous trees on banks in woody places, on sunny slopes in rockeries—for it needs early season warmth—it heralds the approach of an early spring. Perhaps it prefers a limey soil. In the old countries it often bloomed in January; here it flowers in February or March, depending on site and exposure to sun. When grown under trees or on rock garden slopes, near paths, or on banks under shrubbery in protected locations, early bloom is certain. The bulbs of the winter aconite are very small, and many can be planted together in a limited space.

A new hybrid variety, *Eranthis Tubergenii,* has lately come into cultivation. It was first exhibited before the Royal Horticultural Society in February, 1924, by Sir William Lawrence, though it had been grown three or four years before in the gardens of E. A. Bowles and others.

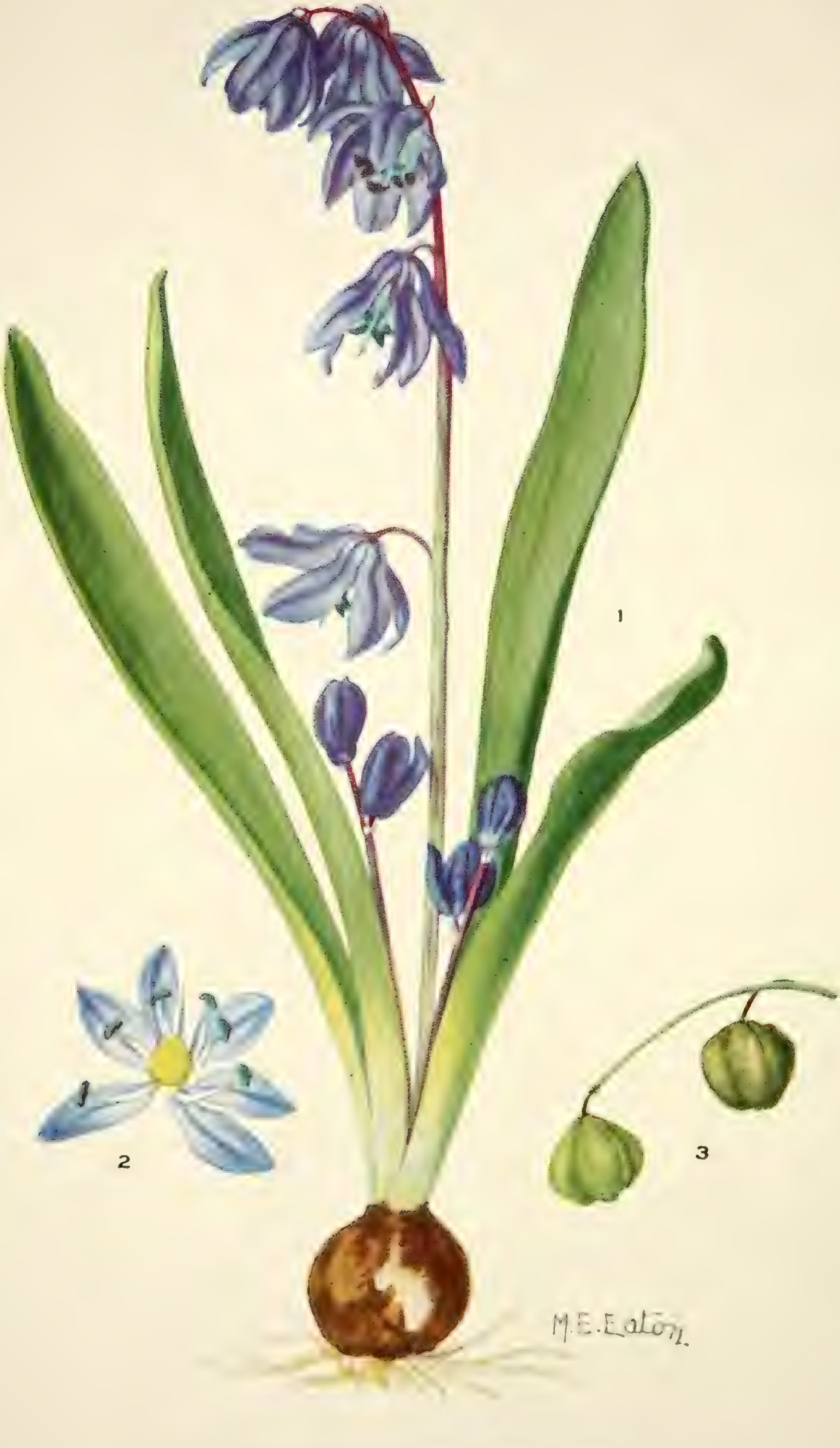
Eranthis Tubergenii was raised by the Brothers Hoog, Holland bulb growers, successors to their uncle, C. G. Van Tubergen, of Haarlem. It was a sterile hybrid of *E. hyemalis* and *E. cilicica* and proved to be more vigorous, with larger flowers, brighter color and sweet scent. The green involucre is more reflexed than in the common *E. hyemalis,* but less finely divided than in *E. cilicica.* The flowers often measure two inches across, and when first exhibited received the award of merit of the Royal Horticultural Society.

The rock garden of the New York Botanical Garden displays in early spring many rare bulbs and plants which came from the garden of Langthwaite, New Rochelle, or were secured from abroad by Mrs. Wheeler H. Peckham. The Van Tubergen's Winter Aconite was brought here with these bulbs in 1928 and from the first season's bloom the illustration for ADDISONIA was obtained.

The winter aconite is a low herb with perennial tuber-like rootstocks. The leaves are all basal, orbicular, palmately dissected nearly to the base into wedge-shaped, linear-lobed segments. The numerous flower stalks are tinged with red above, and bear near the summit, the sessile or clasping, dissected involucre, which becomes reflexed as flowering is completed. The flowers are sweet-scented, two inches across, have from five to eight petaloid sepals. The petals are reduced to small nectaries. The centre of the flower contains twenty to thirty closely packed carpels which develop into a head of many-seeded follicles.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. **Fig. 1.—Plant. Fig. 2.—Flower. Fig. 3.—Anther. Fig. 4.—Stamen. Fig. 5.—Carpel. Fig. 6.—Seed pod after opening.**



SCILLA SIBIRICA ATROCOERULEA

(Plate 516)

SCILLA SIBIRICA ATROCOERULEA

Siberian Squill

Native of Siberia

Family LILIACEAE LILY Family

Scilla sibirica atrocoerulea Hort.

Scilla sibirica is an old garden small-bulb, raised first from seeds imported from Siberia in 1796. It is a beautiful sky-blue arriving with the Glory-of-the-Snow.

Of all the blue bulbs beginning the spring season the Siberian squill is the bluest and the brightest. Small bulbs planted in the lawn bloom early, before the grass needs cutting. We must remember to cut the grass short as possible late in the fall. The bulbs may be planted just under sod lifted by a sharp spade, in holes dug by trowel or crow-bar, or if used in quantity, a special bulb-planter comes in handy. The Siberian squill is effectively massed in the front portions of the herbaceous border, where the richness of the blue shows intensely against the bare ground where later much of the garden will appear. One tendency should be noted in connection with such a planting, that the scillas, together with the Glory-of-the-Snow and the snowdrop are quite apt to spread out toward the edges of the border or into adjoining plantings; they do not like to be confined to restricted groupings such as we associate with the herbaceous border, but prefer to wander about.

Other interesting squills are the *Scilla nutans,* or Wood Hyacinth, with white, pink and pale blue varieties; and the later-blooming Spanish Squill, *Scilla campanulata,* one which naturally makes thick masses of foliage and bluebell-like flowers suitable for permanent edgings of shrubbery borders.

Scilla sibirica, and the smaller bulbs, such as *Galanthus* and *Chionodoxa,* should be planted from two to three inches apart, or from sixteen to thirty-five to the square foot. *Muscari* should be six to eight inches apart, or two to three to the square foot; and *Leucojum, Scilla hispanica,* and *Ornithogalum* five to six inches, or four to six to the square foot.

Among the short and very early irises that can be used with these small bulbs is the bulbous *Iris reticulata.* This is scarce here but can be had from one or two nurseries and is a lovely, violet-scented thing, attractive when grown with the *Scilla sibirica* that is a bright china blue. This is the form *cyanea,* much lighter in color than the Siberian squill *atrocoerulea.* However, the latter is invaluable and may be combined with the lighter form of *Iris reticulata* if you are lucky enough to have it.

In the New York Botanical Garden Scillas are found in the conservatory flower beds, and in the naturalized plantations in the Pinetum and the old Lilac collection.

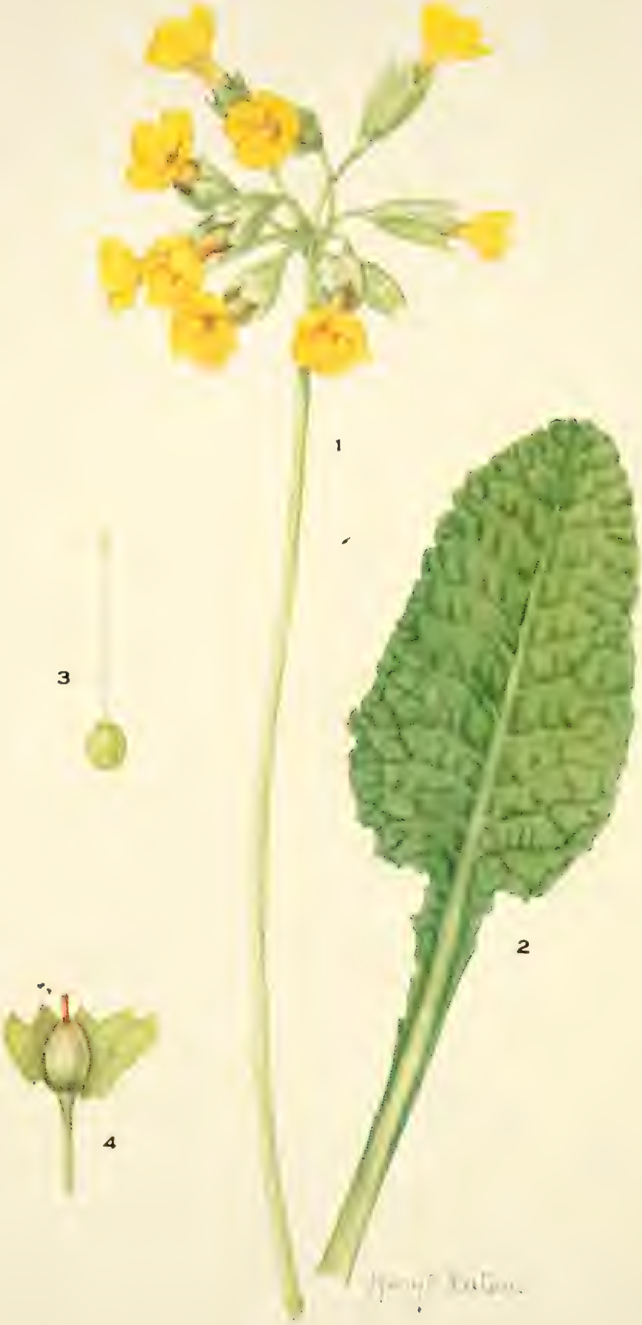
The common Siberian Squills are sibirica blue, and sibirica white. The dark blue variety, *atrocoerulea,* is rare. Blubs were brought from England by Mrs. Wheeler H. Peckham, and given to the rock-garden of The New York Botanical Garden, where flowers were secured for making plate 516.

The most frequent question concerning the scilla is about it's relationship to the Glory-of-the-Snow. The Scilla differs from the Glory-of-the-Snow in that the perianth segments are separated entirely to the base and not united to form a cup below.

The Siberian Squill is a small bulbous plant represented in the resting stage by a small, brown-coated bulb, which sends up at blooming time four linear-lanceolate, partially recurved leaves and striated flowering stalks which bend back to the ground after flowering time, carrying the seed pods to the surface of the soil. The nodding flowers, from three to ten in each raceme, have perianths of six blue, separated, petal-like, lanceolate, obtuse, incurved segments. There are six stamens, attached at the base of the perianth segments, by six filiform, glabrous filaments, surrounding the oval three-celled ovary which lies on the surface of the soil; splitting at maturity to deposit the numerous seeds, which germinate there and form new seedlings.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. **Fig. 1.—Plant. Fig. 2.—Open flower. Fig. 3.—Seed pods.**



PRIMULA VERIS

(Plate 517)

PRIMULA VERIS L.

Cowslip

Native of Europe

Family PRIMULACEAE PRIMROSE Family

Primula veris **L. Sp. Pl. 142. 1753.**

Cowslip—immediately the thoughts of those of us who know the gentle springs of England fly to her meadows and pastures dotted with thousand upon thousand of these fragrant golden flowers—to wee children making and playing with "tisty-tosty" or cowslip balls, and perhaps to some farmhouse or cottage where once one was offered a glass of "cowslip wine." Some may have experienced the sting that comes to the eye on unexpectedly coming across a plant in a garden, for the cowslip and primrose are flowers that are loved.

The word Cowslip is very old and is the Saxon *Cuslippe,* probably referring to the soft texture of the corolla, the curve of whose petals may also be likened to the broad lip of a cow. Some think it named from the resemblance of its scent to the breath of a cow, or it may be to its growing much in pastures and meeting the cow's lips or "licks," though cattle avoid cowslips and all members of the primrose family.

Paigle is another old English name for this plant and Herbalists have called it Palsy-wort. Peter Keys is also used and another quaint name is Jackanapes-on-horseback. *Primula* is derived from the Latin word *primus* (first), and *Primerole* and *Primevère* are its present names in France, but a very old French name is *Herbe à paralysie.* A decoction of the flowers was used of old to cure tremblings, to steady nerves and strengthen the brain; the leaves were applied to wounds. The flowers were dried in the sun and conserved with sugar. Lengthy descriptions for its preparation have been given by an old writer. Flowers were mixed with tea and considered both wholesome and refreshing by country people. The leaves were served as salad. Wine is still made from its blossoms. The part mostly used in medicine was the rhizome and roots, and the corolla alone was sometimes collected for the drug "flores primulae."

Rare in Ireland and Scotland, the cowslip is common in most counties of England except that of Devon. It is also common throughout northern Europe.

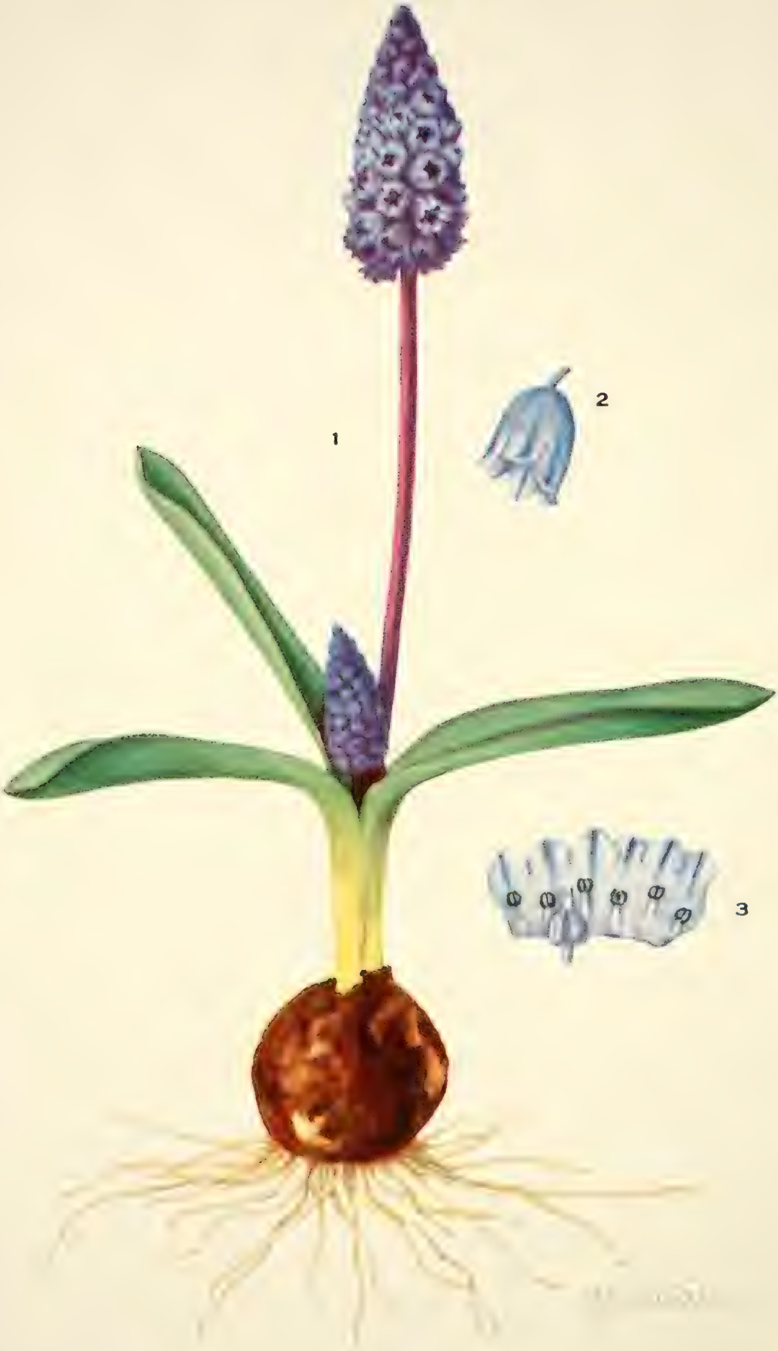
It is a compact little plant, with its tuft of crinkled leaves set well down in the pasture grass. There is a more or less sudden contraction in the middle of the leaf, so that it frequently becomes heart-shaped with a winged-fooot. This is not so with the primrose, *P. vulgaris*. The plant sends up scapes four to eight inches high, bearing crowns of drooping, inflated, pale green calyces containing the small golden or bright yellow flowers, which are concave or cup-shaped with five orange-colored spots in the throat.

The Oxlip, *P. elatior,* is larger than the Cowslip, paler in color and much less abundant. The Primrose, Cowslip and Oxlip are occasionally seen in American gardens, and the well known *Polyanthus* is derived from plants of this genus. Some members of the genus cause an irritation of the skin.

The Cowslip is a perennial, scapose herb, arising from a short rootstock which is usually hidden in a mass of fibrous roots. The leaves are in a basal rosette, three to six inches long, soft-pubescent, especially so beneath, bright green; the blade rugose, but rather thin and hard, ovate, crenate-margined and obtuse, more or less contracted or narrowed to a winged petiole about the same length as the blade or shorter. The scape is pubescent, over-topping the leaves, bearing at its top a many-flowered umbel subtended by small, linear, acute bracts. The flowers are fragrant, dimorphic, bright golden or light yellow, about one-half inch across, or more or less nodding pedicels. The calyx is from one-half to three-fourths of an inch long, pubescent, campanulate and somewhat inflated, five-ribbed, usually a faded, yellowish-green, with five short-ovate, acute lobes. The corolla is salverform, the tube usually shorter than the calyx, but often slightly exserted, the limb concave, with scale-like folds at the slightly contracted mouth, the five lobes obtusely emarginate, each with an orange mark near the throat. The five stamens are inserted on the tube or at the throat of the corolla opposite the lobes. The filaments are very short. The anther-sacs are pale yellow, oblong, opening inwardly by slits. The stigma is capitate. The style is filiform. The ovary is glabrous, nearly globose, one-celled with a central free placent rising from the base, bearing the numerous amphitropous ovules. The capsule is included in the persistent calyx, and is one-celled, opening by five usually bifid valves. The seeds are small and numerous.

MARY E. EATON.

EXPLANATION OF PLATE. Fig. 1.—A flowering scape. Fig. 2.—A leaf. Fig. 3.—The pistil. Fig. 4.—The capsule with the calyx cut away.



HYACINTHUS AZUREUM

(Plate 518)

HYACINTHUS AZUREUS

Azure Hyacinth

Native of the eastern Mediterreanean region

Family LILIACEAE LILY Family

Muscari azureum Fenzl, Del. Sem. Hort. Vindob. 4. 1858.
Hyacinthus azureus Baker, Journ. Linn. Soc. **11**: 427. 1870.

Hyacinthus azureus is a native of Asia Minor and the Mediterranean region and so closely resembles a grape hyacinth that it is often listed in catalogues and written about in horticulture as such. It blooms early in spring, late March or early in April in the vicinity of New York, shortly after *Scilla sibirica,* and is perfectly hardy. John Weathers in his Bulb Book, says that, as the plants bloom very early they are often injured by frost, but the writer has never noticed that here. The writer has grown them with a covering of well-rotted stable manure or with one of salt-hay and with a close growth of young annual larkspur acting as a sort of protection, and they have been grown also with no winter covering and have always come through well. Should they have many of the young larkspurs or other annuals among them these plants must be thinned in spring when the hyacinths are pushing up as they are of too small stature to struggle against strong-growing annuals.

These hyacinths prefer well-drained, gritty soil and indeed, do not object to quite gravelly ground or that besprinkled with small stones. An early short-stemmed cream or white daffodil makes a good background for them. Plants such as these should be grown in quantity to give a satisfactory effect. They seed freely and increase from offsets rapidly. No surface cultivation should be given until the foliage has entirely died away and then as little as possible. Weeding may be done, the roots of the weeds must be well shaken and sifted, good loam may be added to not more than a half inch in depth after such an operation or the removal of the annual plants which have bloomed there. At this time seeds of the annuals may be scattered to make autumn growth and be ready for another year.

There are several forms of *Hyacinthus azureus,* one of which comes from Bulgardagh in Cilicia is much larger and taller, attaining a height of one foot. This, perhaps, should be known as *H.*

ciliatus and it ought to be hardy also as its home is at an altitude of over twenty-seven hundred metres. Another form collected by Mr. Siehe at one thousand metres on Mount Muris in Northern Cilicia is described as one foot high also and it is possible they are identical though Mr. Siehe's plants grew in damp ground and they may be different forms of the same thing.

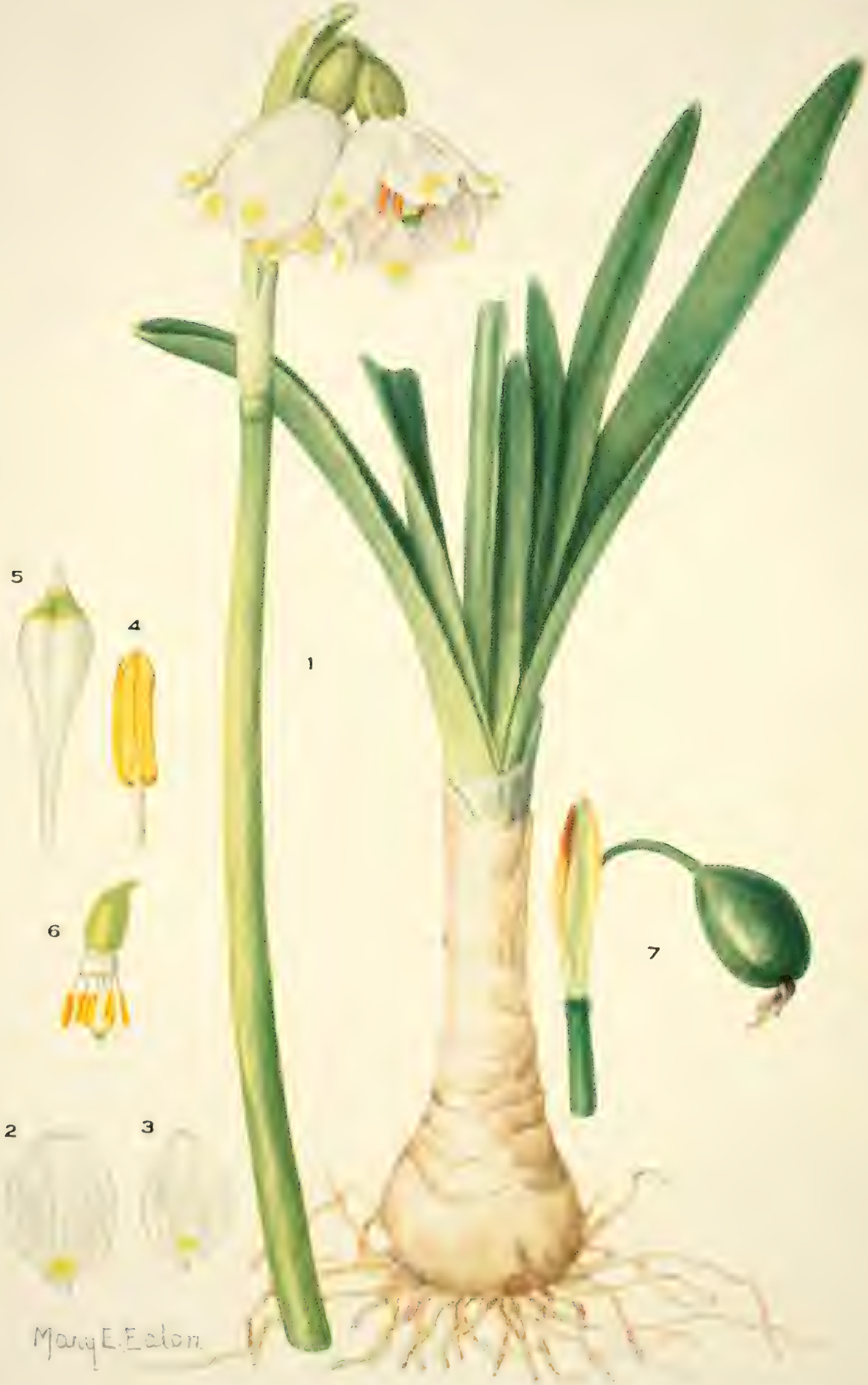
The various forms of *Hyacinthus azureus* force easily and make satisfactory pot-plants for conservatory decoration.

The genus *Hyacinthus* differs from related genera by the campanulate or funnel form flowers, the throat not constricted, the lobes shorter than, or not much exceeding the tube, the stamens attached to the tube or throat by thread-like filaments, sometimes dilated at the base.

The azure hyacinth is a scapose herb arising from a tunicated bulb. The broadly lorate leaves are three to five inches long and blunt at the tip, somewhat glaucous. The reddish scape is about six inches tall, bearing the inflorescence at its summit. The flowers are borne in a very dense, closely-set raceme. The perianth is bright blue, campanulate, with a darker median stripe on each of the divisions, all of which are slightly recurved at the tip. The six blue stamens are borne at or near the base of the perianth-tube. The blue pistil is compound; the style entire, the ovary three-lobed. The fruit is a three-lobed capsule, loculicidally dehiscent.

ETHEL ANSON S. PECKHAM.

EXPLANATION OF PLATE. Fig. 1.—Plant in flower. Fig. 2.—An individual flower, × 2. Fig. 3.—Perianth laid open, showing the attachment of the stamens and the gynoecium.



LEUCOJUM VERNUM CARPATICUM

(Plate 519)

LEUCOJUM VERNUM CARPATHICUM

Carpathian Spring Snowflake

Native of the Carpathian Mountains

Family AMARYLLIDACEAE AMARYLLIS Family

Erinosma carpathicum Herbert, Amaryll. 331. 1837.
Leucojum carpathicum Steud. Nom. ed. 2. 2: 37. 1841.
Leucojum vernum carpathicum Niven, Garden 7: 156. 1875.

There are three forms of the spring snowflake: the type, *Leucojum vernum,* which has but one flower to a stem; with green spots on the perianth segments; *L. vernum Vagneri* with two flowers with dark green spots, and the one pictured here, *L. vernum carpathicum*—which has one, two or three flowers on a stem, the spots on the petals being yellow.

The Carpathian snowflake was collected in the Carpathian Mountains and sent to Messrs. Whitley, Brame and Milne, who gave plants to Kew from whence it was first pictured in color in the "Botanical Magazine" in 1818, though the plant was probably known earlier. Certainly, *Leucojum vernum* was. We can see a woodcut in Matthais de Lobel's "Kruydtboeck" which he entitles "Narcisse met luttel bloemen" which closely resembles either *L. carpathicum* or *L. Vagneri.* John Gerade uses the same woodcut and calls them "bulbous violets," "faire white floures tipped with a yellowish green colour, with many small chives or threds in the middest of the floure." He also says that the Dutch named them "Somer Sottekens; that is Sommer fooles." They perhaps seemed like violets because they had a soft perfume which really reminds one of the warm scent of pansies rather than that of violets.

The spring snowflakes are not usual in gardens in the United States though they were evidently brought to this country by early settlers as there are several places where they have escaped from old gardens and become naturalized. As they have been excluded from this country for some years by a quarantine, though there is no evidence of their being subject to disease, it is difficult to obtain them except with a permit to import.

All of the varieties of *Leucojum vernum* resent moving and, if the bulbs have been kept out of the ground for a number of weeks or months, they will sometimes remain dormant a year before they show growth above ground. The bulbs of the spring snowflakes are smaller than those of the summer varieties and seem to flourish best when they have made themselves into crowded clumps. While it is essential to plant them deep enough so they are covered by at least two inches of soil, it will be noticed that the tops of the necks of the bulbs in established clumps are very little below the surface. The neck is long in proportion to the circumference of the bulb, crowded bulbs being naturally more attenuated than others. The leaves begin to push up in early spring when the ordinary snowdrop, *Galanthus nivalis,* is coming into its prime and, if the weather stays good, the snowflakes will be in full bloom a little over two weeks later. They like full sun in early spring, do not resent semi-shade, and may be placed in a spot that is sunny in spring but shaded in summer. It does not take long for the foliage of the Carpathian snowflake to ripen off and die away, whereas the summer snowflake, *Leucojum aestivum,* retains its foliage a long time and in rainy autumns, is apt to begin to show growth before winter comes on.

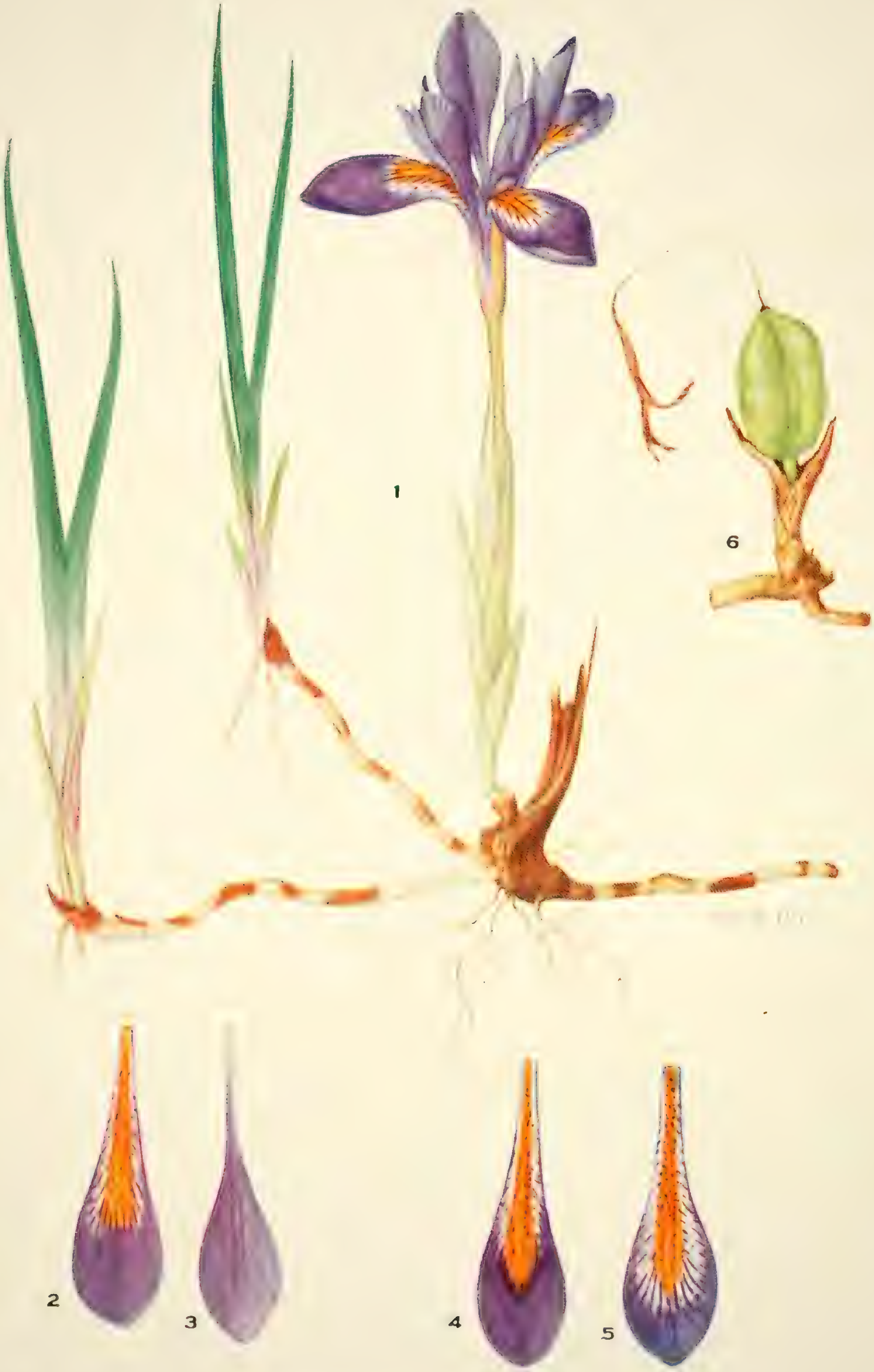
Leucojum vernum carpathicum is easy of culture. It should be planted in ordinary garden loam which is well drained but not too dry and then left to its own devices. Being so near the surface, cultivation should be very gingerly attempted, only a handfork being used. Pansies, forget-me-nots and very shallow rooted sedums may be used for edgings or between the plants. The flowers will keep well in water and make a very pretty arrangement with hardy ferns.

The plants from which the picture was taken were purchased from the famous firm of Messrs. E. H. Krelage & Son of Haarlem, Holland, some years before the Great War and have proved themselves far more hardy and a much better variety than the type and in need of no winter covering other than a ground cover plant or half an inch of hay or peat moss.

The Carpathian snowflake is a scapose herb, arising from a tunicate, long-necked bulb. The several leaves are lorate, bright-green, flattish, and blunt-tipped. The scape is from six to ten inches tall, laterally flattened, bearing at its summit a scarious two-cleft spathe, from which the two or three flowers emerge on nodding, slender pedicels. The perianth is white, about an inch long and broad, the three outer divisions slightly larger than the three inner, all with an apiculate-hooded tip and a blotch of lemon-yellow just below. The six bright yellow, basifixed anthers, on very short and slender filaments are inserted on the hypanthium. The style is white, strumose, with an acuminate tip, and a bright green band immediately below the tip. The stigma is minute and capitate. The ovary is inferior, oblong. The fruit is an obovoid, tardily loculicidally dehiscent capsule.

ETHEL ANSON S. PECKHAM.

EXPLANATION OF PLATE. Fig. 1.—A flowering bulb. Fig. 2.—One of the outer perianth divisions. Fig. 3.—One of the inner perianth divisions. Fig. 4.—A stamen. Fig. 5.—The style. Fig. 6.—The perianth removed, showing the attachment of the stamens to the hypanthium, and of the style to the ovary. Fig. 7.—A capsule.



IRIS VERNA (COASTAL FORM)

(Plate 520)

IRIS VERNA

Violet-iris

Native of the Coastal Plain and adjacent Piedmont of the southeastern United States

Family IRIDACEAE IRIS Family

Iris verna L. Sp. Pl. 38. 1753.

Compared with the eastern North American tall irises, the dwarf ones are now known to be in a striking minority. When Linnaeus published his ''Species Plantarum'' in 1753, only two North American species of iris were known. One of these, the common blue-flag, which he named *Iris versicolor,* has already been figured in ADDISONIA (Plate 316), and the other is here described. Both had been collected by John Clayton on the Coastal Plain of Virginia, and catalogued in Gronovius' Flora Virginica in 1737.

Although no fossil irises are known, so that it is not possible to trace the genus far back into the geologic past, the more recent history of some of the species can be inferred from their present day distribution. Prior to the Tertiary epoch, the Coastal Plain as we now know it was non-existent, and plant species which now occur upon it must represent descendants from those which at that time grew in other provinces, especially in the southern Alleghenies and in the Piedmont plateau. As the newly deposited strata gradually emerged from the sea, seeds of many of the upland plants became dispersed over the fresh land surface, and in cases where the soil and climatic conditions proved favorable, new colonies were developed. In some cases the descendants which proved adapted to the strange surroundings are morphologically indistinguishable from those which remained behind. In others, the differences in physiological influences which made survival in the new territory possible were accompanied by differences in morphology as well. The violet iris group appears to represent an instance of the latter type of relationship.

On comparing the plants of violet iris which at present grow in the Piedmont of North Carolina and adjoining states with those found on the Coastal Plain, it is found that the latter have developed a more lax habit, with slender, long jointed rootstocks, and a smaller, usually more fragrant flower which has narrower-clawed sepals and longer-clawed petals. These features persist throughout its known range, which extends from central Georgia to southeastern Pennsylvania, on the Coastal Plain and rarely just above the Fall Line on the Piedmont.

Iris verna occurs native in sandy or peaty soil which is strongly acid in reaction, and attempts to cultivate it in ordinary non-acid garden soil have always failed, although it appears to be hardy some distance north of its natural range. While sometimes growing in apparently wet places, its roots are usually well up on dryish hammocks, and it seems to thrive best in sandy open woods where the water table is several inches below the surface. Its usual associates are the acid loving shrubs of the Heath Family and related groups, such as Azaleas, Vacciniums, and Desmothamnus.

Although the technical name of this species is not inappropriate, as it is one of the earliest irises to bloom in the spring—appearing in March in the southern, and earliest May in the northern, portions of its range— the name given to it by the layman in many parts of the south is violet iris (or sometimes just violet). This refers to the fact that both in color and fragrance it bears a striking similarity to the English sweet violet (*Viola odorata*).

In the violet-iris the rootstock is very slender throughout, swollen only where the new growth goes up which is two to six inches apart. On the long white internodes no roots are borne; at the nodes, the entire leaf-base is persistent, though dry and brown, for several years. The leaves are four to eight inches tall, white at and near the base and reddish along the hyaline edges of the sheathing portion. The blades are less than a quarter of an inch wide, faintly tinged with purplish-red about three quarters of an inch above the base. The bases of the spent leaves are persistent on the rootstocks as yellow-brown sheaths. The involucre is sessile, of usually five imbricate bracts, the outer one scale-like, the inner ones narrow, successively longer, accuminate, light-green. The flower is erect, four to six inches tall, sessile or very short-pedicelled, violet-scented. The hypanthium surrounding the ovary is obscurely three-angled, bright-green. The free extended part—flower-tube—is slender, light-green or yellowish-green, purple-tinged, sometimes only in lines about the slightly expanded top, equalling the involucre or exceeding it. The sepals are one and a half to one and three quarters of an inch long, spatulate-cuneate, not sharply distinguished into claw and blade; within with a minutely papillose orange and brownish spotted crest extending from the base to within a third or a quarter of the apex, usually with flecks of white and lines of violet between the crest and the violet margins and the tip which is also obscurely lined with deeper violet. The three petals are about as long as the sepals, spatulate, with a very slender, channelled, pale-violet claw and an obovate or elliptic-obovate, deeper violet blade. The three stamens are scarcely three-quarters of an inch long. The filaments are slender-subulate, pale-violet tinted. The anthers are linear, shorter than the filaments, rounded and minutely pointed at the apex, the basal lobes obtuse, violet. The three style-branches are narrowly cuneate, about an inch and a quarter long, pale at the base deeper-violet above. The style-appendages are half-ovate, about a quarter of an inch long, entire or undulate. The stigma is entire. The capsule is similar to that of the mountain form, but smaller and with a shorter pedicel.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Part of a plant in flower. Fig. 2.—A sepal. Fig. 3.—A petal. Fig. 4 and 5.—Sepals from other plants from the same locality. Fig. 6.—A capsule. Fig. 7.—A seed.

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PLATE 492. PHYSALIS ELLIOTTII
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PLATE 496. CITHAREXYLUM FRUTICOSUM
PLATE 497. SABINEA FLORIDA
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PLATE 520. IRIS VERNA (COASTAL FORM)

ADDISONIA

COLORED ILLUSTRATIONS
AND
POPULAR DESCRIPTIONS
OF
PLANTS

VOLUME 16 NUMBER 2
JUNE, 1931

PUBLISHED BY
THE NEW YORK BOTANICAL GARDEN
(ADDISON BROWN FUND)
JULY 21, 1931

ANNOUNCEMENT

A bequest made to the New York Botanical Garden by its late President, Judge Addison Brown, established the

ADDISON BROWN FUND

"the income and accumulations from which shall be applied to the founding and publication, as soon as practicable, and to the maintenance (aided by subscriptions therefor), of a high-class magazine bearing my name, devoted exclusively to the illustration by colored plates of the plants of the United States and its territorial possessions, and of other plants flowering in said Garden or its conservatories; with suitable descriptions in popular language, and any desirable notes and synonymy, and a brief statement of the known properties and uses of the plants illustrated."

The preparation and publication of the work have been referred to Mr. Edward Johnston Alexander, Assistant Curator, and Mr. Kenneth Rowland Boynton, Head Gardener.

ADDISONIA is published as a quarterly magazine, in March, June, September, and December. Each part consists of eight colored plates with accompanying letterpress. The subscription price is $10 annually, four parts constituting a volume. The parts will not be sold separately.

Address:

THE NEW YORK BOTANICAL GARDEN
BRONX PARK
NEW YORK CITY

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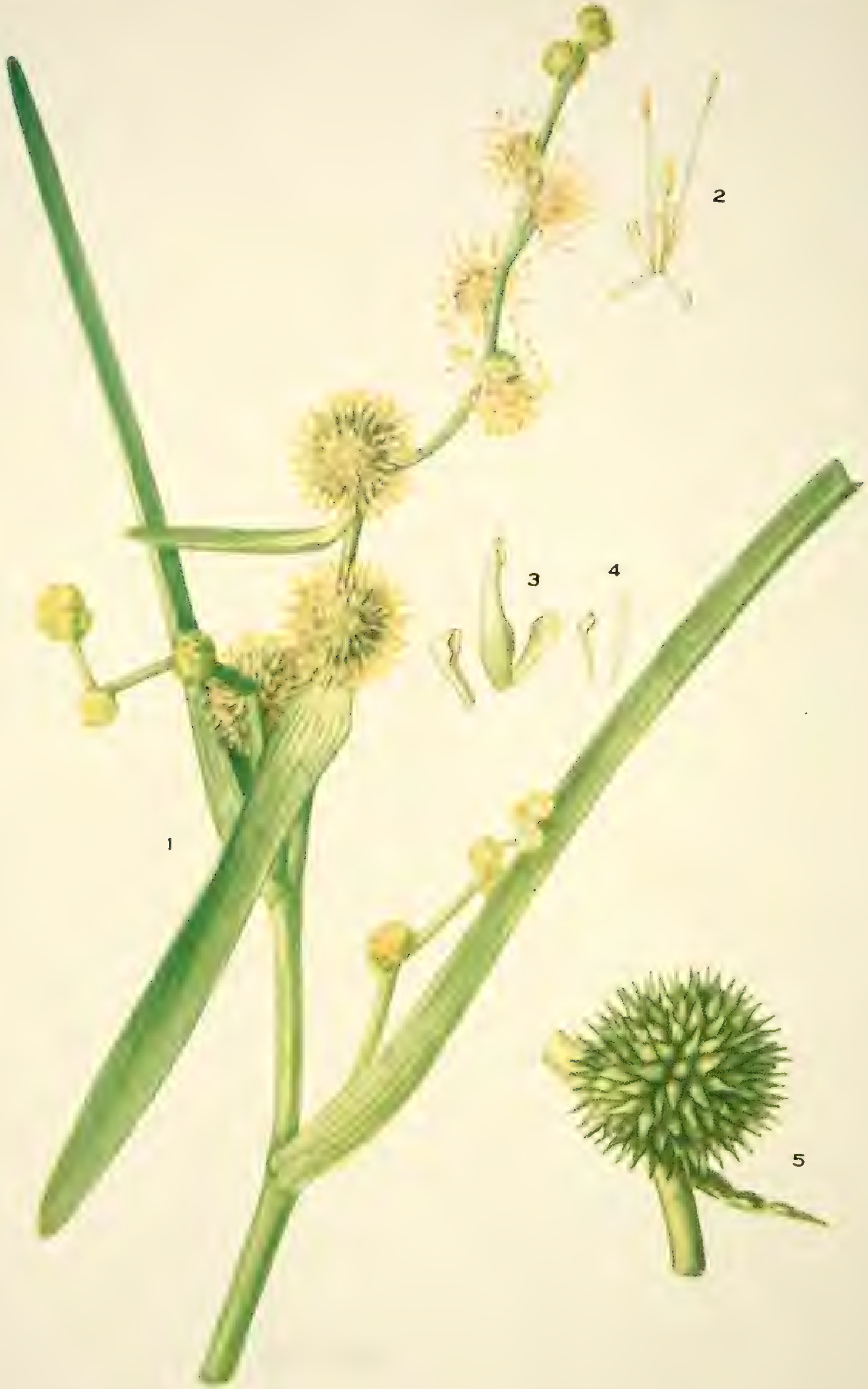


SPARGANIUM ANDROCLADUM

NEW YORK BOTANICAL GARDEN

(Plate 521)

SPARGANIUM ANDROCLADUM

Branching Bur-reed

Native of Eastern North America

Sparganium simplex androcladum Engelm.; A. Gray Man., ed. 5, 481. 1867.
Sparganium androcladum Morong., Bull. Torr. Club **15**: 78. 1888.
Sparganium americanum androcladum Fernald and Eames, Rhodora **9**: 87. 1907.

On first seeing bur-reed growing in swamps or along and in slow moving streams and ponds, if it is not in flower or fruit, it is often mistaken for some kind of lily, for its somewhat flattened, yellow green leaves do not look very unlike some members of the lily family. When in flower however, it will never be mistaken for anything else, for its spikes of scattered fuzzy-looking heads are both unmistakable and characteristic, and later, when the round heads of fruit form, the uninitiate often wonders where the sycamore tree is that has dropped its fruit before it ripened, until on closer examination, the ''sycamore'' balls prove to be attached to a stem rooted in the ground.

In places where the bur-reed chooses to grow, its dense growth of lush, green leaves lend a soft and fresh appearance to the landscape, for there is no other plant in the same locality with leaves of such an attractive and soft-appearing shade of green. Swamps, meadows, slow moving streams and ponds or their banks, from Newfoundland south to Florida and west to Minnesota and Louisiana are its chosen habitat, and there one may go at any time from April to September and feast their eyes on its fresh green, or in May in the latitude of New York to see its straw-colored heads of flowers.

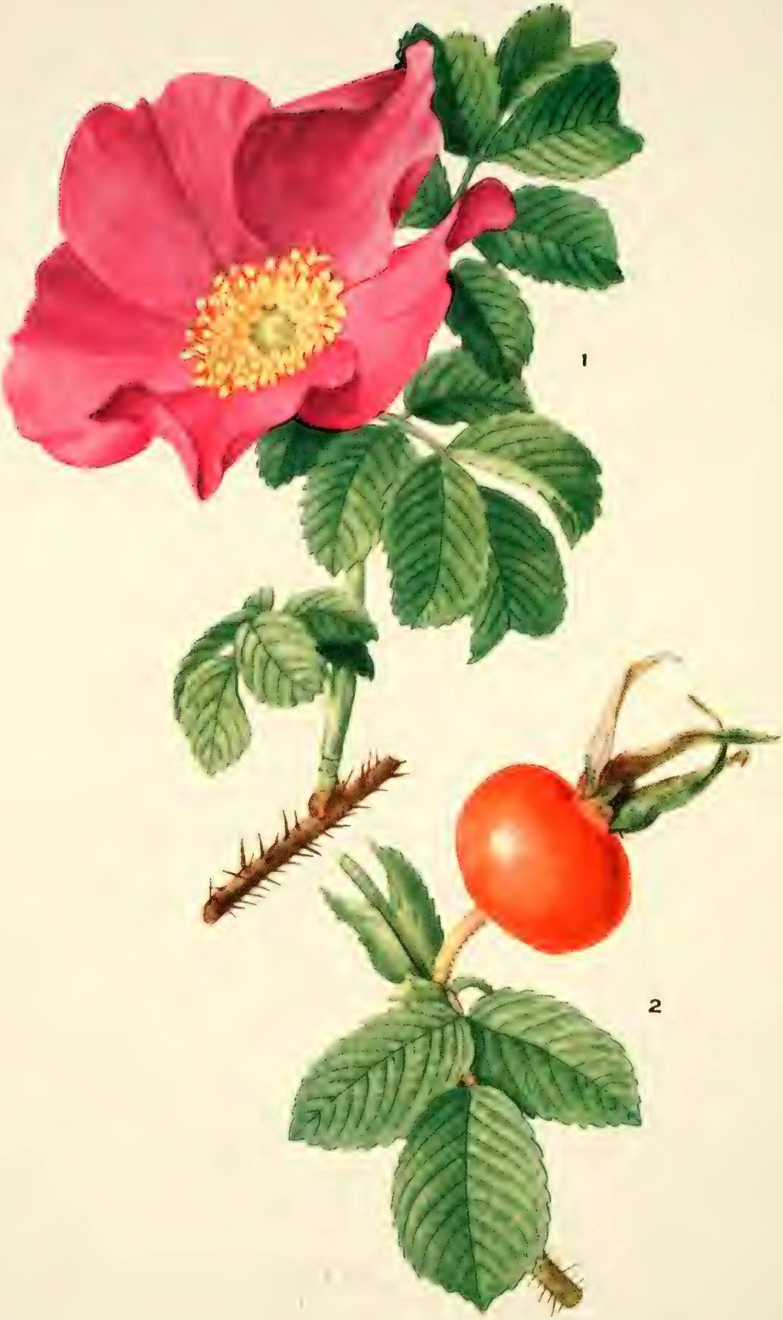
The name Sparganium is thought to be derived from the Greek word meaning a band, in allusion to its ribbon-like leaves.

This is a truly desirable plant for water gardens where one has pool or stream margins to be planted, or for shallow water around the edges of ponds, but should only be used where plenty of space is available, as it spreads rather rapidly, but its delightful shade of green is unrivaled among native plants.

The branching bur-reed is a perennial marsh plant, with creeping rootstocks and fibrous roots. The leaves are alternate, linear, light green, sheathing at base, one to three and one half feet long, triangular at the base. The inflorescence usually overtops the leaves, branching widely, each branch subtended by a bract similar to the leaves but smaller, the bases slightly dilated and narrowly scarious margined. The staminate heads are sessile, and are uppermost on the inflorescence branches, one fourth to one half inch in diameter. The pistillate heads are sessile or peduncled, axillary. The perianth is of a few irregular chaffy scales. The stamens are commonly five; the filaments distinct. The ovary is sessile, one-celled. The fruiting heads are one half to three quarters of an inch in diameter. The mature nutlets are brown, dull, fusiform, about one fifth of an inch long, terete or obtusely angled, often constricted at the middle.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Inflorescence. Fig. 2.—Staminate floret × 4. Fig. 3.—Pistillate floret × 4. Fig. 4.—Parts of the pistillate floret × 4. Fig. 5.—Head of fruit.



ROSA RUGOSA

(Plate 522)

ROSA RUGOSA

Ramanas Rose

Native of China, Japan and Korea

Family ROSACEAE ROSE Family

Rosa rugosa Thunb., Fl. Jap. 213. 1788.

One of the most fortunate rose introductions brought to the attention of the American public was the Ramanas or Rugosa rose, *Rosa rugosa*. In the gardens of the Eastern United States one of the principal rose problems has been one of hardiness. At the sacrifice of a long summer blooming period, the American Rose Society has advocated the dissemination of several varieties of hardy, door-yard, bush roses for June, rose-blooming time, especially for localities with winters which are rather severe on the Hybrid Tea and other long-blooming types.

The rugosa roses have brought first of all a foliage which has helped in the campaign against diseases and insects. Rough, leathery, and thick, the leaves seem to be immune.

Rosa rugosa first attracted attention in 1845, at the time of its first introduction from Japan. The hardiness, disease-resistant qualities of the foliage, and vigor of the growth of this species was not at first considered by the rose-growers of the period.

Single flowers of pink, purple, and red are considered forms of the original species from Japan and Kamtchatka. The simple varieties are *rugosa albo-plena,* double-white; *rugosa rubro-plena,* crimson; *rugosa alba,* single white.

Perhaps the size and color of the rugosa rose is not appreciated, because most of the varieties bloom before the usual happy rose season, and the colors are intense and the flowers rather large for the queen of flowers.

Conrad Ferdinand Meyer has blooms which are individually often larger than roses from any other type of bush. *Conrad F. Meyer* is considered to be the most beautiful of the rugosa roses in bloom: it is certainly the producer of the largest flower, and the possessor of the strongest, tallest, thorniest canes.

The requisite condition is, first of all, plenty of room for this variety; it soon covers many square yards of ground; and the constant attention to pruning out of old and decayed canes. This variety, *Conrad F. Meyer,* is the most strikingly colored variety. *Mme. Julien Potin,* a French rose of nearly twenty years ago, approximates but does not quite reach the value of *Conrad F. Meyer;* it is also one of the most vigorous of bush roses and requires a great deal of room. The finest white sort, and there are three or four excellent white rugosa roses, is *Blanc Double de Coubert.* This was introduced in 1892 from France, and has clear white, double flowers, freely produced, measuring four to six inches across when fully opened. One of the later rugosa hybrids is the Canadian variety *Agnes,* introduced in 1922. This is a supposed hybrid between Persian Yellow and a *Rosa rugosa alba,* a white species. Because of the fact that this rose is yellow and has the usual rugosa characteristics, it is considered to be very unusual.

Two of the newer varieties, sponsored by the American Rose Society are *Rev. E. M. Mills,* pink and yellow hybrid with *Rosa Hugonis* and *Sarah Van Fleet.* These are fragrant, rose-pink, and are supposed to take up rôles as bush-hardy American door-yard types of disease-resistant stocks.

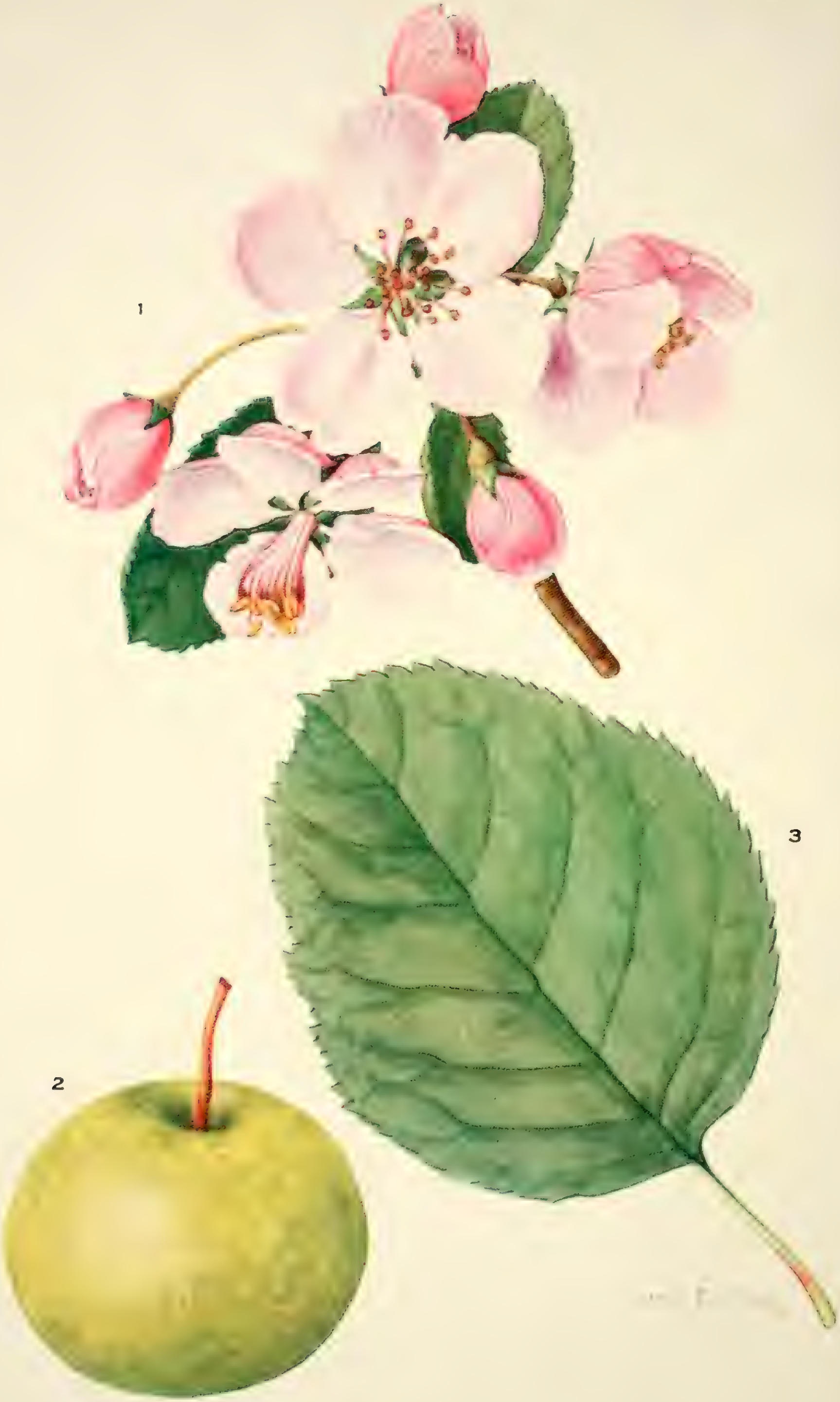
A very interesting new type of rugosa rose is the *F. J. Grootendorst* and *Pink Grootendost,* which combine the vigor and hardiness of the rugosa blood with the flowers and everblooming habit of the polyantha rose. The blooms are red and pink, clustered and fringed.

The Rugosa rose has also produced a trailing variety, called *Max Graf,* used to cover the ground.

The Ramanas rose is an upright shrub, eight to ten feet tall, with stems heavily armed with needle-like spines and bristles. The leaves are compound, the bristly petioles subtended by large, broad ovate-acuminate stipules. Each leaf has five to nine leaflets, which are thick, ovate, rugose, dull green and glabrous above, pale and pubescent beneath. The flowers are solitary or few in a loose corymb, two to three and one half inches across. The sepals are narrow, lanceolate, often leafy at the tip, usually upright and persistent. The petals are up to one and one half inches long, nearly as broad, slightly indented. The fruits are depressed-globose, orange to deep red, and last well into late autumn on the plants.

KENNETH R. BOYNTON

EXPLANATION OF PLATE. Fig. 1.—Flowering shoot. Fig. 2.—Fruiting shoot.



MALUS PLATYCARPA HOOPESII

(Plate 523)

MALUS PLATYCARPA HOOPESII

Hoopes' Flowering Crab

Native of eastern North America (?)

Family MALACEAE APPLE Family

Malus coronaria var. *Hoopesii,* Rehder, Trees and Shrubs **2**: 142. 1911.
Malus platycarpa var. *Hoopesii,* Rehder, Trees and Shrubs **2**: 227. 1913.

After the beautiful cultivated Japanese cherries have reached the peak of their early bloom and the crab apples and pears fall in line to fill the ranks with new flowers, the blossoms of Hoopes' flowering crab first begin to attract the eye. The large pink, single, showy flowers borne in great abundance amid the green foliage of the trees are indeed a delight to behold.

Our native crabapples are a beautiful and showy lot of trees when in flower, their great profusion of pink or roseate, exceedingly fragrant flowers making them prominent features of the landscape wherever they grow. The majority of the species being perfectly hardy, they are much used for ornamental planting.

The fruits are extremely hard and sour, but may be made into a most delicious jelly.

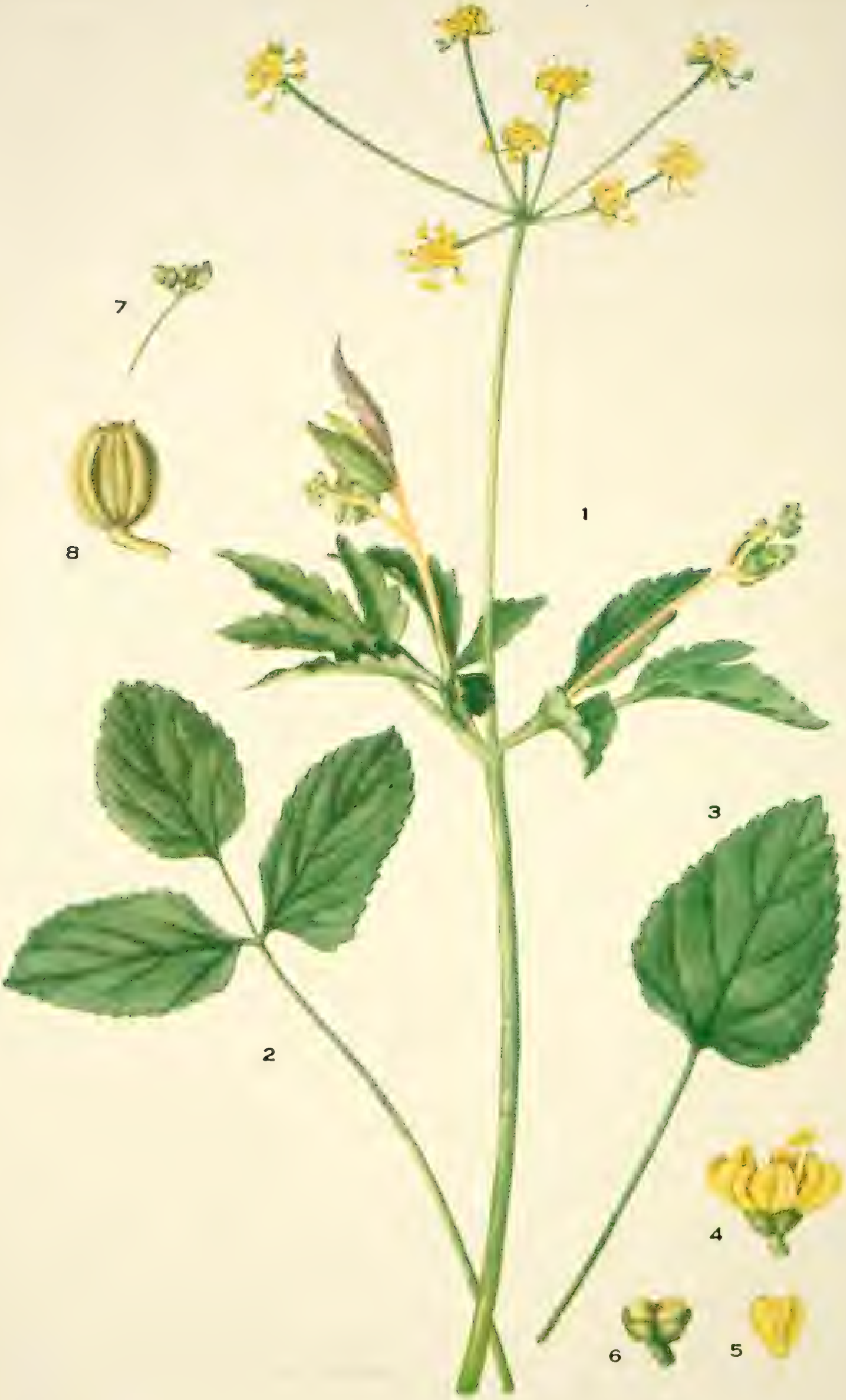
This variety, only known in cultivation, was originally distributed by the Hoopes Brothers Nursery in 1876. It was first named as a variety of *Malus coronaria* by Rehder in 1911. Two years later he transferred the variety to his new species, *Malus platycarpa,* native to the Appalachian Mountains from northeastern Ohio south through West Virginia and Kentucky to North Carolina and Georgia.

This variety differs from the species only by its pubescent pedicels and calyx.

Malus platycarpa is a tree eighteen to twenty feet high with a trunk four to five inches in diameter. The branches are spreading and unarmed; the branchlets at first thinly villose-tomentose, becoming glabrous the first season, and turning brown, ultimately becoming grayish brown. The winter-buds are glabrous, except for the villose margins of the scales. The leaf-blades are dark yellow-green, lustrous on the upper surface, lighter below, two and one half to three inches long, and one and one half to two and one half inches wide, doubly serrate, rounded at the base, white-pubescent when they unfold; the petioles slender, villose, becoming nearly glabrous, about an inch and a half long. The pink flowers, about one inch and a half in diameter are borne three to six in a cluster on glabrous pedicels about two inches long. The calyx tube is glabrous. The calyx lobes are lanceolate, acuminate, longer than the tube, glabrous without, densely tomentose within. The petals are obovate-orbicular, irregularly incised-dentate, abruptly contracted at the base into a short claw, sparingly villose near the base within, one half inch to one inch wide. The stamens are slightly shorter than the petals, the anthers brownish yellow. The styles are five in number, shorter than the stamens, villose on the lower half, and united below for one third their length. The fruit is depressed globose, with a deep cavity at the base and apex, dull yellow-green, about an inch and a half high and slightly over two inches wide. The seeds are about one third inch long. The variety Hoopesii differs from the above description by having the pedicels, the calyx-tube, and the outside of the calyx lobes pubescent.

E. H. FULLING.

EXPLANATION OF PLATE. Fig. 1.—Flowering cluster. Fig. 2.—Mature fruit. Fig. 3.—A mature leaf.



ZIZIA BEBBII

(Plate 524)

ZIZIA BEBBII

Bebb's Golden Alexanders

Native of the Alleghany Mountains

Family AMMIACEAE CARROT Family

Zizia aurea var. *Bebbii* Coult. & Rose, Bot. Gaz. **12**: 138. 1887.
Zizia Bebbii Britton, Mem. Torrey Club **2**: 35. 1890.

The species of *Zizia* Koch are known as Alexanders, on account of a slight resemblance to the Alexanders of Europe, *Smyrnium Olusatrum* L., which is cultivated and used in the same way as celery. The genus consists of but three North American species: *Z. aurea* (L.) Koch, the common Golden Alexanders, *Z. cordata,* the Heart-leaved Alexanders, and the present species. They were also sometimes called Meadow Parsnip, but this name really belongs to the genus *Thaspium* Nutt. The general habit of the two genera is very much alike, as well as the leaves and the yellow color of the flowers. Not only amateurs have confused them but even some of our best scientific botanists. Dr. Gray, for example, for years applied the name *Thaspium aureum* var. *apterum* to *Z. aurea* and *T. trifoliatum* var. *apterum* to *Z. cordata.* The word *apterum* means wingless. In *Thaspium,* the fruit bears well-developed wings on the ribs, while in *Zizia* the fruit is wingless. This, however, is not the only difference between the genera, but the most conspicuous.

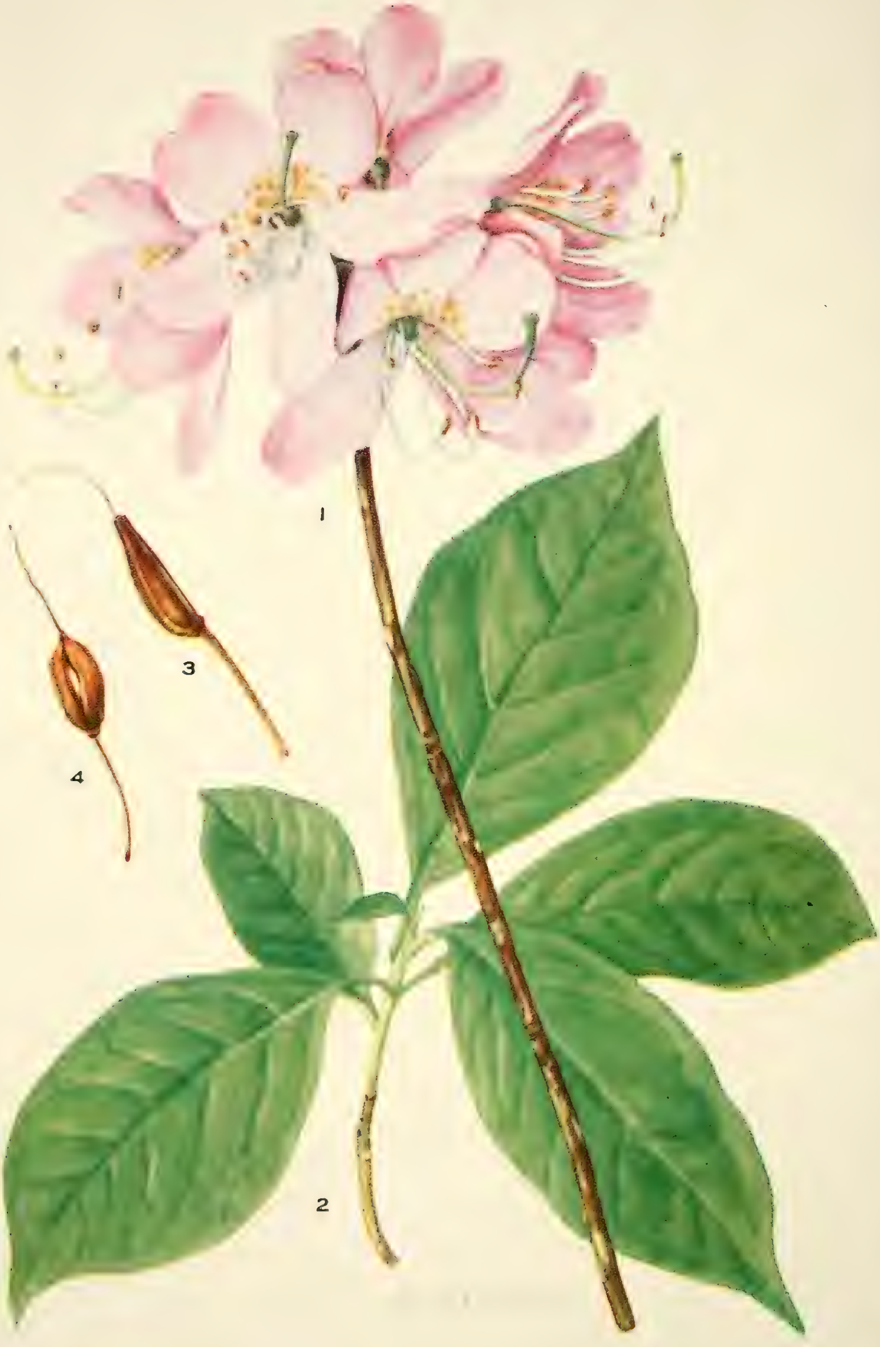
While both *Z. aurea* and *Z. cordata* are generally distributed throughout eastern North America, extending into the Rocky Mountain region, *Z. Bebbii* is confined to the Allegheny Mountains, in Virginia, West Virginia, North Carolina, Georgia and eastern Tennessee, at an altitude of from two thousand to five thousand feet. It prefers open woods and mountainsides. The illustration was drawn from a specimen cultivated in The New York Botanical Garden, raised from roots collected by the writer on Mount Pisgah, North Carolina, in the summer of 1925.

Z. Bebbii was collected by some of the earlier botanists, as for instance Curtiss, Canby, Buckley and Schweinitz, but mistaken for *Thaspium trifoliatum.* It was first described as *Zizia aurea* var. *Bebbii* by Coulter and Rose in the *Botanical Gazette.* The authors named the plant in honor of Mr. M. S. Bebb, of Rockford, Illinois, not because he had collected the plant. The reason is implied in the following sentence: "In separating the species *Zizia* from the *Thaspium aureum* group we are very much indebted to Mr. M. S. Bebb, who has placed the careful observations of ten years at our disposal, and who is convinced that they are abundantly distinct." Dr. N. L. Britton gave the plant specific rank, which it certainly deserves.

Zizia Bebbi is a slender plant, one to two feet high, from a woody rootstock. The stems are often several, glabrous, mostly simple below and branched above. The basal leaves are slender-petioled, the earliest often simple with an ovate, crenate-dentate, glabrous blade, the next are ternate, the terminal leaflet long-stalked and the lateral ones short-stalked or sessile; all with more ovate leaflets. The lower stem-leaves (not shown in the illustration) are long-stalked and usually twice ternate and some of the leaflets, especially the terminal ones, occasionally lobed; the upper stem-leaves are short-stalked, with narrower, more deeply toothed leaflets. The umbels are long-peduncled at the ends of the stem and branches, compound and without an involucre. The rays are few and one to two and a half inches long. The involucre consists of a few short lance-awl-shaped bractlets. The flowers are short-pedicelled; the sepals triangular; the petals bright yellow, and hooded; the fruit is rounded-oval, slightly compressed laterally, about one twelfth of an inch long and nearly as wide; each carpel is somewhat five-angled in cross-section with one oil-tube in each interval, except on the commissural side, where they are two.

P. A. RYDBERG.

EXPLANATION OF PLATE. Fig. 1.—Upper part of the plant. Figs. 2 and 3.—Basal leaves. Fig. 4.—Flower × 8. Fig. 5.—Petal × 10. Fig. 6.—Ovary × 10. Fig. 7.—Bunch of fruits, nat. size. Fig. 8.—Fruit × 6.



BILTIA VASEYI

(Plate 525)

BILTIA VASEYI

Appalachian Rose

Native of the North Carolina Highlands

Family ERICACEAE HEATH Family

Rhododendron Vaseyi A. Gray, Proc. Am. Acad. **15**: 48. 1879.
Azalea Vaseyi Rehder, Moll. Dents.
Biltia Vaseyi Small, Fl. SE. U. S. 884. 1903.

In the highlands as in the lowlands many plants escaped the sharp eye of the plant collectors of the transition period of the eighteenth to the nineteenth century as well as collectors and botanists up to near the close of the latter century.

The subject of this note is one of the conspicuous examples. Exceedingly showy in flower and evidently different from its associates in leaf and fruit, it remained hidden in the wonderful highlands of the southern Alleghenies. Harbored there in ancient times, unlike some of its relatives which have moved out to the Atlantic or to the Gulf of Mexico, destroying their trails behind them, this shrub has refused to be moved from its primeval habitat.

The plant has, in our floristics, superficially at least, presented a dilemma to botanists, in that it has the foliage of an azalea and the flowers of a rhododendron. Hence, it has masqueraded, technically, under both of these genera, and popularly, to the eyes and to the imagination of some of the highland folk was suggested the popular name ''rhodazale.'' Taxonomically considered, those who fit all plants into ready-made botanical pigeonholes had the choice of two, *Rhododendron* and *Azalea.* It masqueraded under the former for a score of years and then under the latter for a decade. After that the name of George W. Vanderbilt, a patron of botany and the developer of Biltmore Estate, really a vast botanic garden, within the native haunts of this plant, was used in the form of *Biltia* for the generic name.

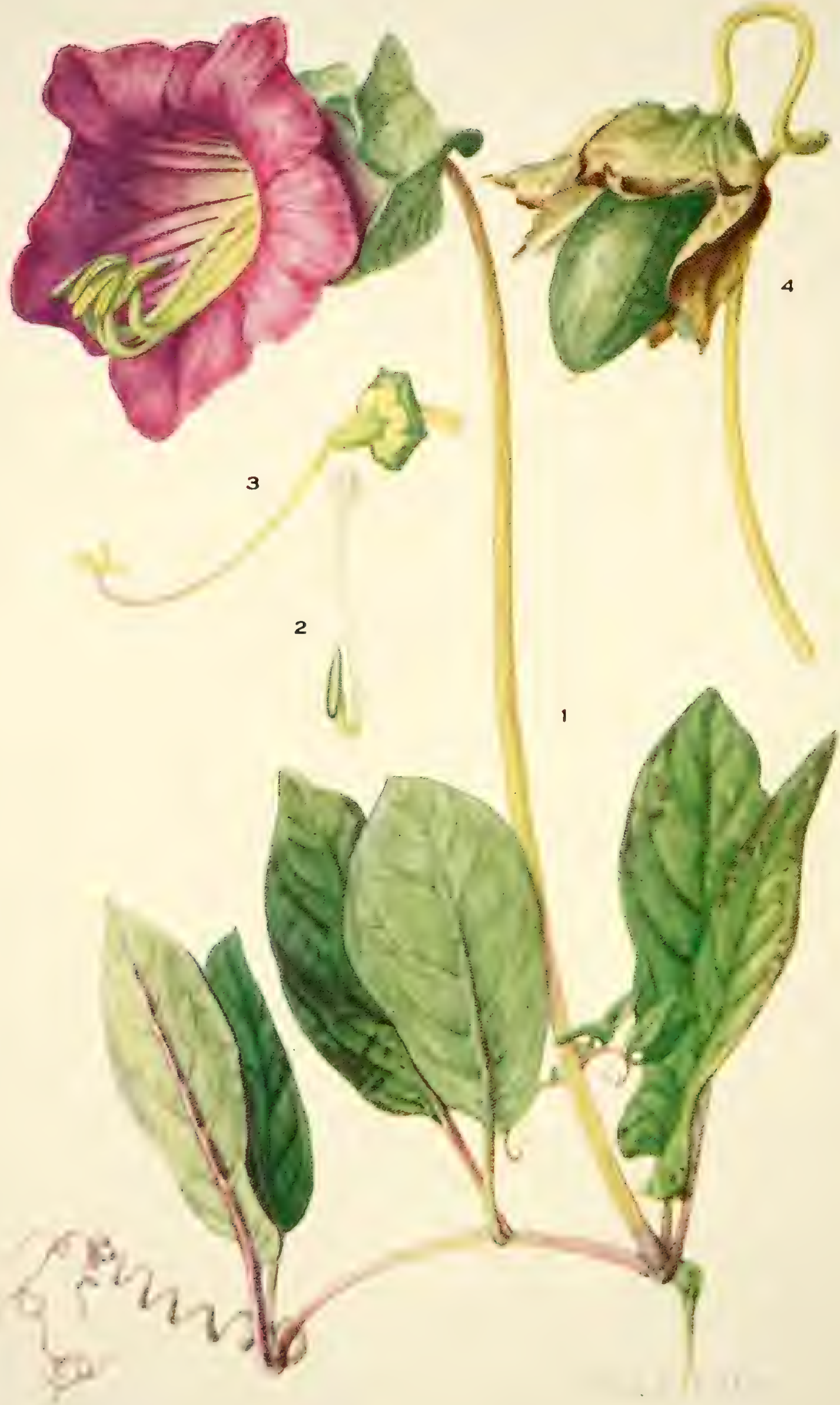
Geographically *Biltia* is restricted to the mountains of North Carolina at altitudes ranging from thirty-five hundred to six thousand feet, although reported erroneously from the mountains of South Carolina. Its usual floristic associates are, mountain laurel (*Rhododendron maximum*), blue-laurel (*R. catawbiense*), and ivy (*Kalmia latifolia*). During its long career *Biltia* has adopted itself to various habitats. These form a scale from cliffs, ravines, and mountain slopes, to swamps.

The leaves of *Biltia* suggest those of the cultivated peach. The bilabiate, campanulate corollas of the flowers which appear mainly before the leaves, mostly in May and June, are pure rose-pink or ''pastelle''-pink with yellow or dark-crimson fleckings. They, however, vary to paler and darker shades of pink, and albinos, with almost pure-white corollas may be occasionally found. This species made rapid strides when once discovered: first found in 1878, named and described in 1879, and introduced into cultivation in 1880. The plants are hardy at the north, and naturalized specimens have been found in eastern Massachusetts. Given a partly shaded location and preferably acid soil, it is one of the most desirable and showy of the native heaths for decorative landscaping, as it is easy to grow and the great quantity of flowers, which appear before the leaves in early spring make a splendid display.

Biltia is an irregularly branched, nearly glabrous shrub three to fifteen feet tall, the branches more or less spreading, light red-brown at the end of the first season. The leaves are alternate, deciduous. The winter buds are ovoid, obtuse. The blades are elliptic or oblong-elliptic, two to six inches long, membranous, acuminate at both ends, ciliate, with a prominent midrib beneath, short-petioled. The flowers, appearing before the leaves, are borne five to eight in clusters. The pedicels are three-eighths to three-quarters of an inch long, somewhat glandular. The calyx is oblique, with the short lobes erose-glandular. The corolla is rotate-campanulate, mainly rose-pink or ''pastelle''-pink. The five lobes are ovate to obovate, unequal, the two lower divergent, inequilateral, the three upper spreading, with dark-crimson, yellow-orange or reddish-orange fleckings. The stamens are seven or sometimes five. The filaments are glabrous. The capsule oblong-ovoid, about a half-inch long, lobed.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Flowering spray. Fig. 2.—Leafy spray. Fig. 3.—Mature capsule. Fig. 4.—Opened capsule, showing method of dehiscence.



COBAEA SCANDENS

(Plate 526)

COBAEA SCANDENS

Cup-and-Saucer-Vine

Native of Mexico, Costa Rica and Brazil

Family POLEMONIACEAE PHLOX Family

Cobaea scandens Cav., Ic. **1**: 11. 1791.
Rosenbergia scandens House, Muhlenbergia **4**: 23. 1908.

Of all the various vines grown from seed the Purple Cup-and-Saucer-Vine or Cobaea, has the largest, most showy flowers. The vines which are woody, or perennial, are more permanent but are not as spectacular.

The Cup-and-Saucer-Vine is a vigorous climber, an individual among the annual vines reaching a height of twenty-five feet in some cases and bearing big bell-shaped blooms, pink to purple in color.

The name *Cobaea* was given in honor of Father Cobo, a Spanish Jesuit naturalist of the seventeenth century. The showy corollas are green in bud, turning to purple upon opening, borne in profusion during the summer.

The foliage has many interesting characteristics. The leaves are compound, each leaf consisting of two or three leaflets, the terminal leaflet being represented by a twining branched tendril. With these tendrils, the vine is enabled to climb.

There is a white-flowered variety, *Cobaea scandens alba,* and occasionally a form with variegated leaves occurring.

The Cup-and-Saucer-Vine is useful for covering porches and trellises, climbing to rough surfaces or to wire netting, twining to mediums by its tendrils.

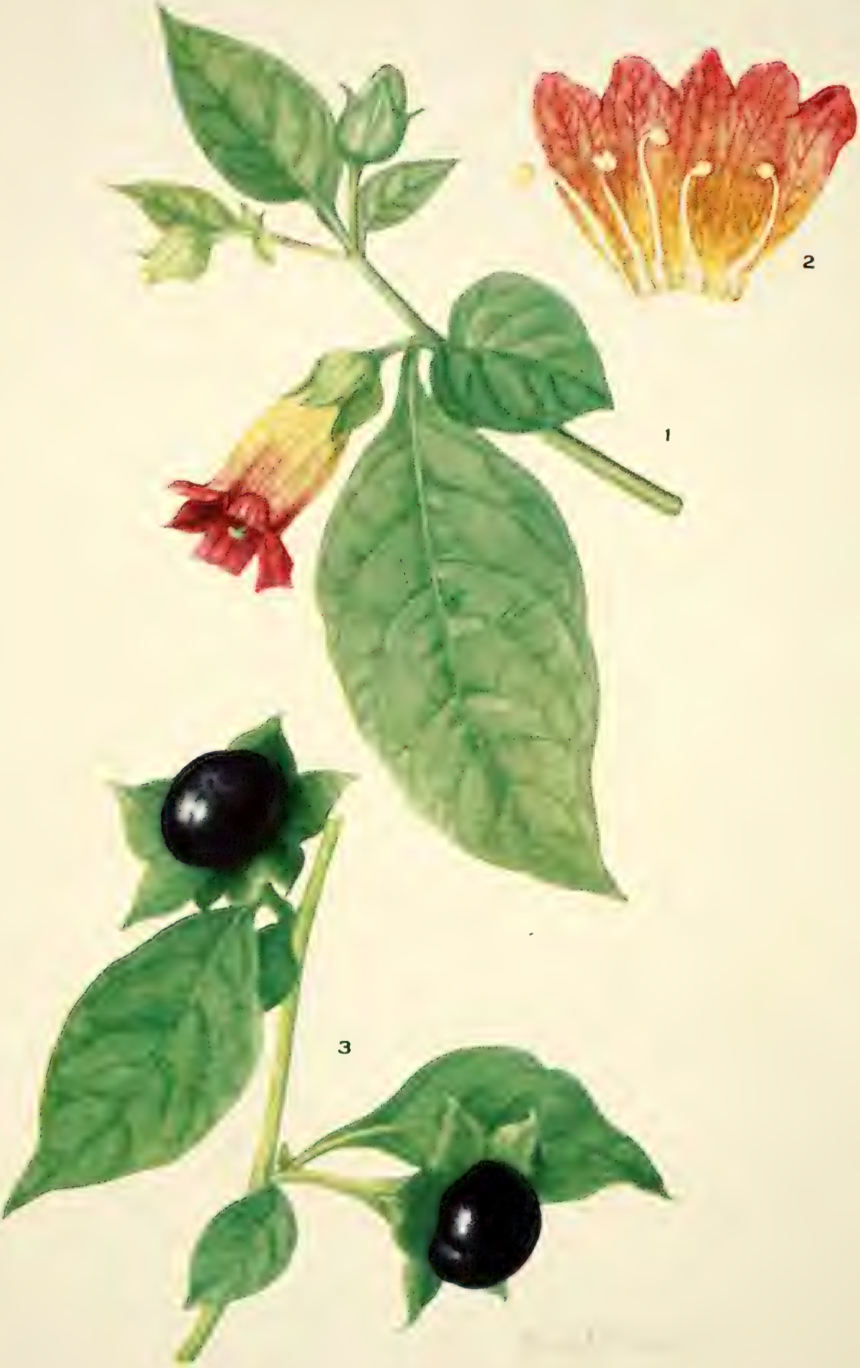
This annual vine is noted for its quickness of growth, and early covering of bare surfaces. Formerly it was used for permanent decoration of conservatory walls. The Cup-and-Saucer-Vine is raised from seeds which should be sown in April. The large seeds of this vine have long been held up as an example of special handling. They should be pressed into the soil edgewise, as they are large and flat, and germinate poorly when planted broad side down.

Cobaea prefers a warm, sunny, soil, which should be augmented by greenhouse conditions for starting when possible. If started in the greenhouse in February or March, the plants should be constantly shifted, tied up on stakes, and pinched back several times, so that they will become bushy. Short-jointed, stocky plants are the most desirable. Seeds may be sown in flower pots in the house, and set out-doors when the weather becomes warm and settled.

The Cup-and-Saucer is a rapidly growing herbaceous vine, up to thirty feet high. The leaves are compound, glaucous-green, smooth, alternate, pinnate, the leaflets are in two or three pairs, ovate, or the lowest pair often eared, the terminal leaflet represented by a long tendril which is often branched and curved. The flowers are bell-shaped solitary, nodding, axillary on long thick, curved peduncles; and are up to one and one half inches across. The style and stamens are long-exserted, the latter with prominent heart-shaped anthers attached by long slender filaments to the white hairy throat of the corolla. The calyx is pentagonal and winged before opening. The five sepals are ovate, cuspidate, large and greenish-white, spreading after flowering. The corolla is bell-shaped, much larger than the calyx, with a five-lobed limb, the lobes rounded, revolute, with wavy margins. The fruits are plum-shaped, oval, pendant, capsules; three-celled and angled.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Flower and leaf. Fig. 2.—Stamen. Fig. 3.—Pistil. Fig. 4.—Fruit with persistent calyx.



ATROPA BELLADONNA

(Plate 527)

ATROPA BELLADONNA

Belladonna

Native of South Europe and Asia

Family SOLANACEAE NIGHTSHADE Family

Atropa Belladonna L., Sp. Pl. 181. 1753.

Belladonna, a perennial poisonous plant, was first introduced into general medicine about the year 1860. The first recorded data on the use of the drug goes back to 1504. It was then used as a poison and also as a cosmetic. Linnaeus assigned the name *Atropa* to the drug after the name of the oldest of the "Three Fates," the one which according to mythology made it her business to sever the thread of life. The function of her office could easily be performed with this plant. Italian women seem to have used this substance to dilate the pupils of their eyes for the express purpose of improving their appearance. Hence on account of its capacity to beautify the female of the species the name "Belladonna," which is the Italian for handsome women, was applied to this drug.

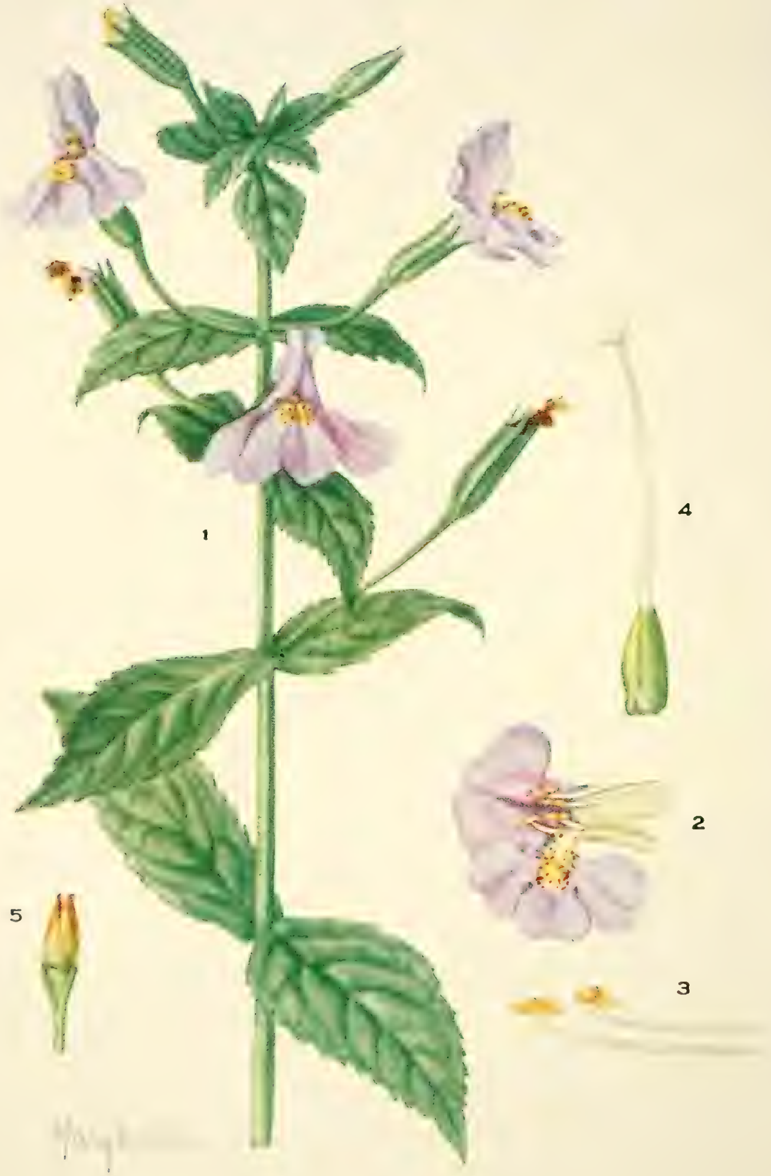
The activity of the belladonna plant, therapeutically, is dependent upon its containing mydriatic alkaloids. The most important constituent derived from the plant is atropine. The use of atropine was discovered accidentally when a drop of a freshly prepared extract of belladonna got into the eye of the compounder. After a brief irritant action, total blindness resulted, from which recovery took place in a few hours. This observation opened the way to a new method of using the drug in optometry. While all parts of the plant yield atropine, the greater quantity is found in the stoloniferous rootstocks.

The plant inhabits waste places, is found along roadsides and ruins. It seems to prefer chalky and limestone districts and is cultivated to some extent in Europe. During the war belladonna was extensively cultivated in this country. The accompanying plate was made from plants growing in the economic plantation of the New York Botanical Garden.

Belladonna has a much branched rhizome which yearly sends up rank stems to the height of three to five feet. The stems are thick, purplish, longitudinally wrinkled, usually hollow, with younger parts flattened and sparingly pubescent. The whole plant has a heavy unpleasant odor which is more marked when the leaves or young stems are crushed. The leaves are alternate, broadly ovate, shortly acuminate or acute at the apex, entire and from three to eight inches in length. The flowers are greenish or dull purple, about one inch in length, and arise singly in the axils of the leaves. The calyx is five-cleft with lobes ovate-acuminate. The corolla-tube, which is much longer than the calyx, is dull purple, the lobes slightly unequal, recurved and hooked at the apex. The anthers are whitish in color with style and stigma green. The fruit is a subglobular berry containing many seeds. The fruit is subtended by a dark green calyx, about the size of a cherry, deep violet black in color, with a sweetish taste and sometime eaten with fatal results. Most accidents occur with children who mistake the berry for some other edible fruit.

WM. J. BONISTEEL.

EXPLANATION OF PLATE. Fig. 1.—Flowering branch. Fig. 2.—Opened corolla tube showing adnate stamens. Fig. 3.—Mature fruit.



MIMULUS RINGENS

(Plate 528)

MIMULUS RINGENS

Violet Monkey-Flower

Native of eastern North America

Family SCROPHULARIACEAE FIGWORT Family

Mimulus ringens L., Sp. Pl. 634. 1753.

When midsummer holds sway over the Atlantic States and through the upper Mississippi Valley, those who search marshy meadows and woodland swamps will be rewarded by seeing the peering faces of the monkey-flowers. Those also who flee from the intense heat of our lowlands to the mountains or the northern forests will be equally sure to see the monkey-flowers along secluded lakes and winding stream-courses. This interesting plant is as wide-spread as it is familiar.

The father of modern botany, Linnaeus, knew this plant, not only from specimens brought from America by early explorers, but also from living plants grown in his own botanical garden attached to the University of Upsala, Sweden. The resemblance of the flowers to monkey faces caught his fancy, and to this we owe the happy selection for it of the name ''Mimulus'' or ''little mimic.''

Botanists later extended this idea to a wide circle of two-lipped or bilabiate flowers, calling them collectively the ''Personatae,'' from the Latin word ''persona,'' meaning ''mask'' or ''false face.'' The resemblance has not always proved to be racial, although most of these plants have since been placed in the Figwort Family. Such similarity in flower-form is due to the fact that the plants are bidding for attention from the same groups of winged insects, for visits that will mean the transportation of pollen from flower to flower, thus ensuring cross-fertilization and the setting of seed. Personate flowers all stand horizontal in position, and the expanded lower lip, often as in our monkey-flower differently colored and roughened by short stiff hairs, assures the visitor of foothold. Such flowers frequently tend to be violet or blue, colors that seem to be preferred by the most vigilant and industrious of all pollinating insects, the bees.

The closeness of the corolla-lips of the monkey-flower would preclude the visits of pollinating insects other than bees. Only a bee of some size, usually or always a bumblebee, can push her way in, 32

pressing apart the corolla-lips, and so succeed in sucking the nectar from the base of the flower. In doing this she brings her hairy back, laden with dusty pollen from other flowers, against one of the sticky flat stigmas that curve down from the cleft of the upper lip of the flower. As soon as this sensitive stigma has caught up the fresh pollen, it quickly closes against its fellow; meanwhile the insect becomes well dusted anew with pollen from the two pairs of anthers against the upper side of the corolla-throat, and this new load remains on her back undisturbed as in withdrawing she passes beneath the now closed stigmas. By such a mechanism is self-pollination prevented, and cross-pollination insured!

In eastern North America we have two species of monkey-flower, closely alike in habit and flower. Ours, the long-stalked violet monkey-flower, may be recognized by the long peduncles and the narrow leaf-blades that clasp the merely angled stem; it occurs from northern Georgia and Oklahoma northward to Prince Edward Island and Manitoba. The other, the short-stalked violet monkey-flower, *Mimulus alatus* Solander, has shorter peduncles, wider leaf-blades that narrow to a petioled base, a wing-angled stem, and slightly more purple flowers; it is more southerly in range, occurring from northern Florida and Texas northward to Connecticut and southern Michigan.

The long-stalked violet monkey-flower is a wholly glabrous plant, from its system of perennial rootstocks sending up each year much branched stems from two to four feet tall. The leaves are opposite, serrate, lanceolate to ovate-lanceolate, tapering to tip and at base clasping the stem. The peduncles are from one to two inches long. The five sepals are joined into a strongly ridge-angled tube, the free lobes being lanceolate-attenuate. The corolla is one inch long, the throat horizontally flattened and two-ridged and hairy within anteriorly, the upper lip with erect lobes that are laterally reflexed, the lower lip widely spreading; the color of the corolla is pale hortense-violet, except on the raised base of the lower lip (the palate), which is marked with yellow areas and spotted with purple-red. The fruit is a two celled loculicidal capsule, nearly one half inch long, enclosed within the calyx-tube. The seeds are minute, yellow, and faintly reticulate.

F. W. PENNELL.

EXPLANATION OF PLATE. Fig. 1.—Top of a flowering stem. Fig. 2.—Corolla, laid open. Fig. 3.—Stamens × 3. Fig. 4.—Pistil × 3. Fig. 5.—Capsule with the calyx removed.

RECENT PLATES

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PLATE 500. PROUSTIA KRUGIANA
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ADDISONIA

COLORED ILLUSTRATIONS
AND
POPULAR DESCRIPTIONS
OF
PLANTS

VOLUME 16 NUMBER 3

SEPTEMBER, 1931

PUBLISHED BY

THE NEW YORK BOTANICAL GARDEN

(ADDISON BROWN FUND)

OCTOBER 14, 1931

ANNOUNCEMENT

A bequest made to the New York Botanical Garden by its late President, Judge Addison Brown, established the

ADDISON BROWN FUND

"the income and accumulations from which shall be applied to the founding and publication, as soon as practicable, and to the maintenance (aided by subscriptions therefor), of a high-class magazine bearing my name, devoted exclusively to the illustration by colored plates of the plants of the United States and its territorial possessions, and of other plants flowering in said Garden or its conservatories; with suitable descriptions in popular language, and any desirable notes and synonymy, and a brief statement of the known properties and uses of the plants illustrated."

The preparation and publication of the work have been referred to Mr. Edward Johnston Alexander, Assistant Curator, and Mr. Kenneth Rowland Boynton, Head Gardener.

ADDISONIA is published as a quarterly magazine, in March, June, September, and December. Each part consists of eight colored plates with accompanying letterpress. The subscription price is $10 annually, four parts constituting a volume. The parts will not be sold separately.

Address:

THE NEW YORK BOTANICAL GARDEN
BRONX PARK
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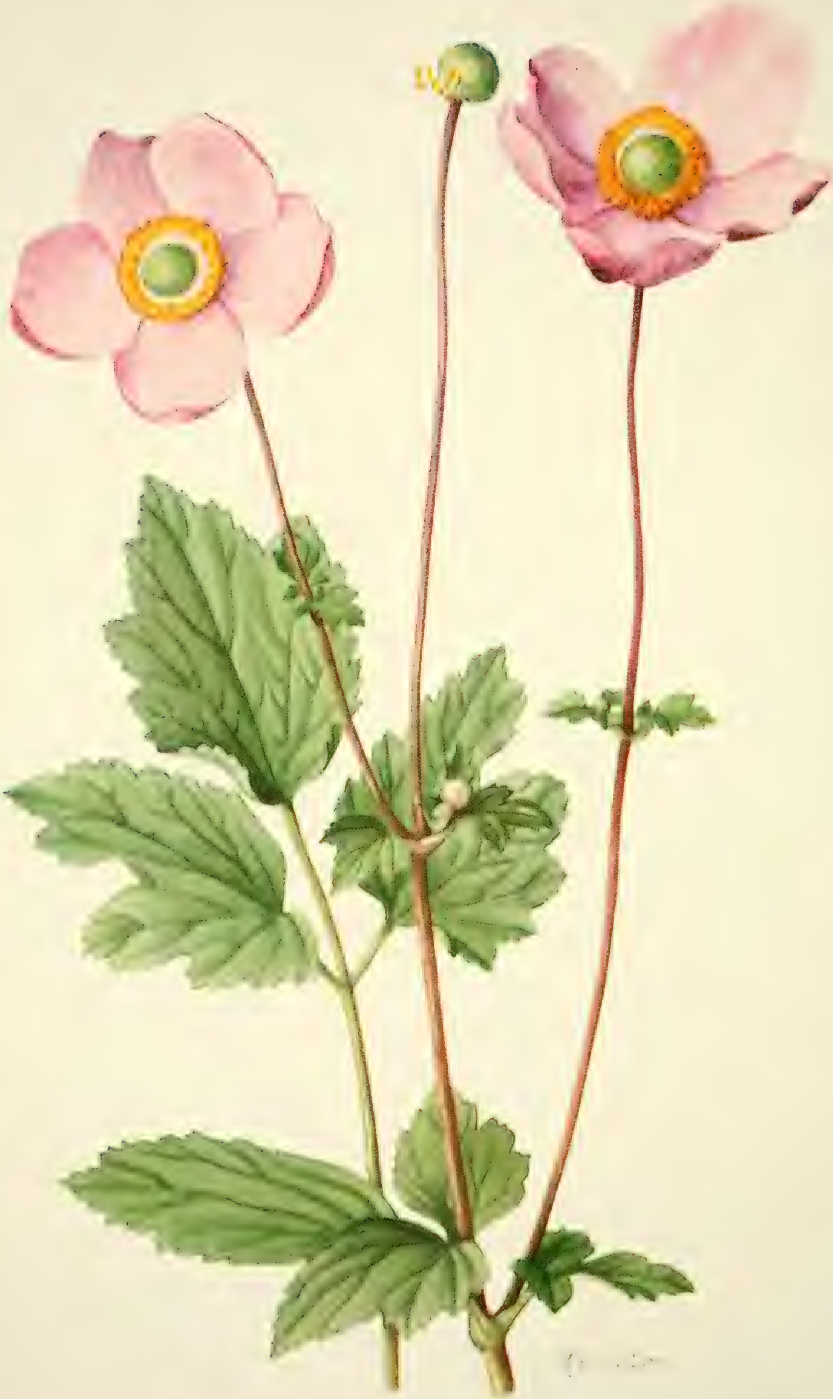

ANEMONE HUPEHENSIS

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(Plate 529)

ANEMONE HUPEHENSIS

Hupeh Anemone

Native of Central China

Family RANUNCULACEAE CROWFOOT Family

Anemone hupehensis Hort.
Anemone japonica Sieb. & Zucc., Fl. Jap. **1**: 15. 1835.
var. *hupehensis* Hort.

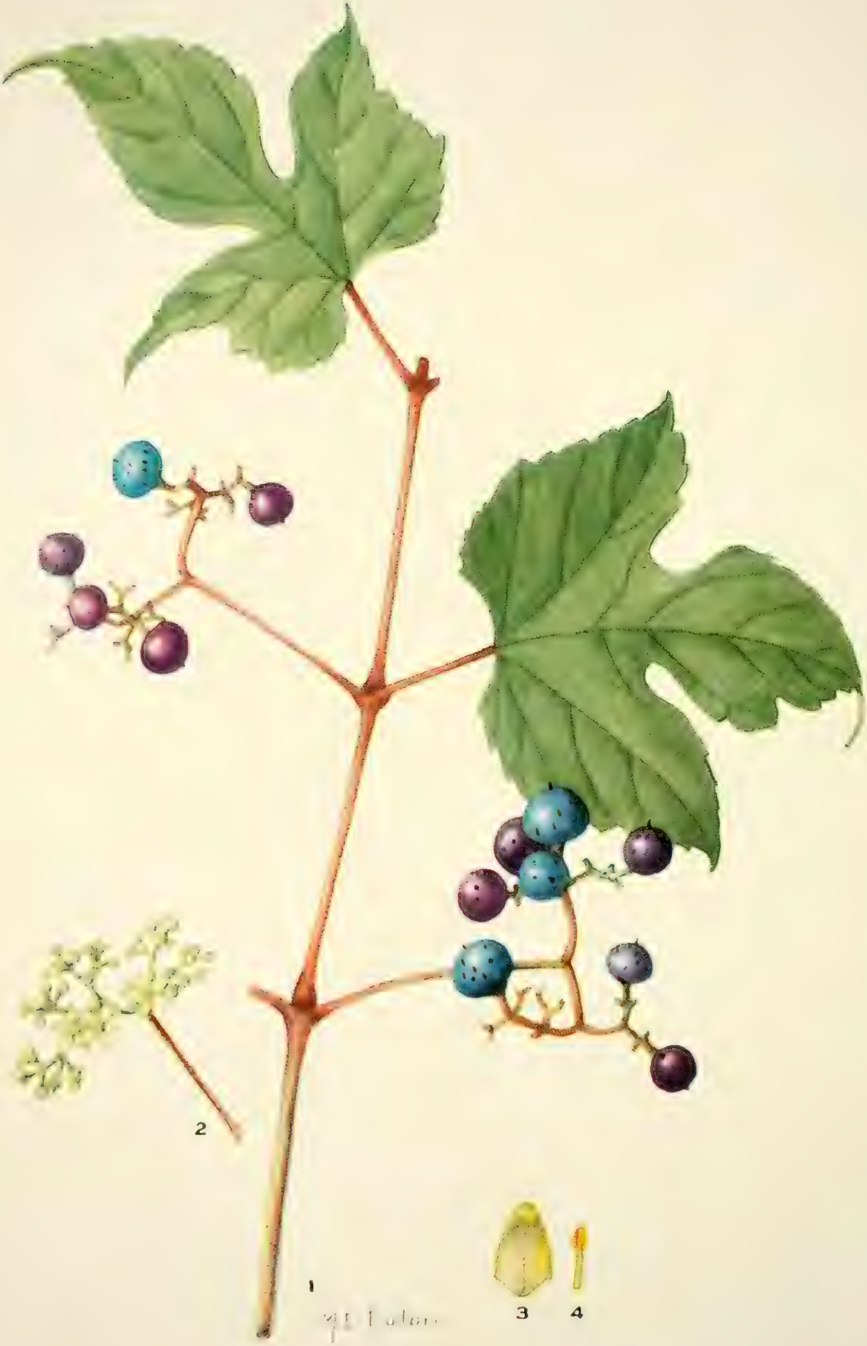
Anemones of gardens are of four main types: the famous pasqueflowers of alpine home and rock-garden localities, *pulsatillas,* with silky, purple flowers, intense in color, from the Alps and our own Rocky Mountains: tuberous kinds grown by florists and estate conservatory owners, the *coronaria* and St. Brigid anemones of blue, pink, white, double, and fringed sorts: the wind-flower beauties of the United States, *pennsylvanica, caroliniana, canadensis,* and others: and the showy late blooming Asiatic flowers related to the present subject.

The Japanese anemone is one of the flowers considered to be a late-blooming, standard garden subject; as a matter of fact it is a summer-bloomer, and also a difficult thing to keep, not strictly hardy, and not permanent in any one location. The *Anemone hupehensis* is earlier than the usual varieties, and so far has proved hardier and more lasting in some localities.

Plants of the Hupeh variety of *Anemone japonica* are grown in exactly the same manner as the Japanese varieties. They appreciate a little shade, but in other respects they are of easy culture. All Asiatic anemones of this type are apt to spread out and leave the old crowns behind. The Asiatic anemones are propagated easily by means of divisions of the crowns, but more rapidly by means of root cuttings taken in early spring. Take the roots of old plants; cut them into two inch pieces; place them in boxes of sandy soil, covering to a depth of about an inch. Keep damp in a cool cold-frame, and when green shoots reach a length of two to three inches, pot up and plunge in ashes. When rooted plant out in nursery or garden.

The Hupeh Anemone is probably only a form of the famous Japanese Anemone of gardens. It is a perennial herb, with branching stems, two to three foot high, soft, downy, and bearing ternate leaves, irregularly lobed and toothed, with many flowers in summer, of a rose-pink to mauve color. From an involucre of finely divided leaves, flowers are borne on long stalks. The flower color is due to a calyx of about five petal-like, colored sepals, the flowers are two inches in diameter and appear in summer before the Japanese anemones are in bloom. There are no true petals, and the fruits are not as showy as those of the near relative, Clematis.

KENNETH R. BOYNTON.



AMPELOPSIS HETEROPHYLLA

(Plate 530)

AMPELOPSIS HETEROPHYLLA

Japanese Woodbine

Native of eastern Asia

Family VITACEAE GRAPE Family

Vitis heterophylla Thunb., Fl. Jap. 103. 1784.
Ampelopsis heterophylla Sieb. & Zucc., Abh. Akad. Muench. 4^2: 197. 1845.

Blue-berried vines for ornamental purposes whose berries are conspicuous and showy are not at all common, and one that is perfectly hardy and of fairly rapid growth should be a welcome and useful plant for many purposes. The Japanese woodbine is not, however, a recent introduction, having been introduced into horticulture not long after its discovery by Thunberg in the latter part of the eighteenth century.

There are now several varieties known in cultivation, of which the nearly entire-leaved form seems to be the most common in the neighborhood of New York. Our illustration is probably, according to Bailey, the variety *Maximowiczii* of Rehder, which is the original species *heterophylla* of Siebold and Zuccarini, and of Thunberg, whose specific name we are using. There is also a variety with variegated leaves, and one with more deeply lobed and more numerously lobed leaves.

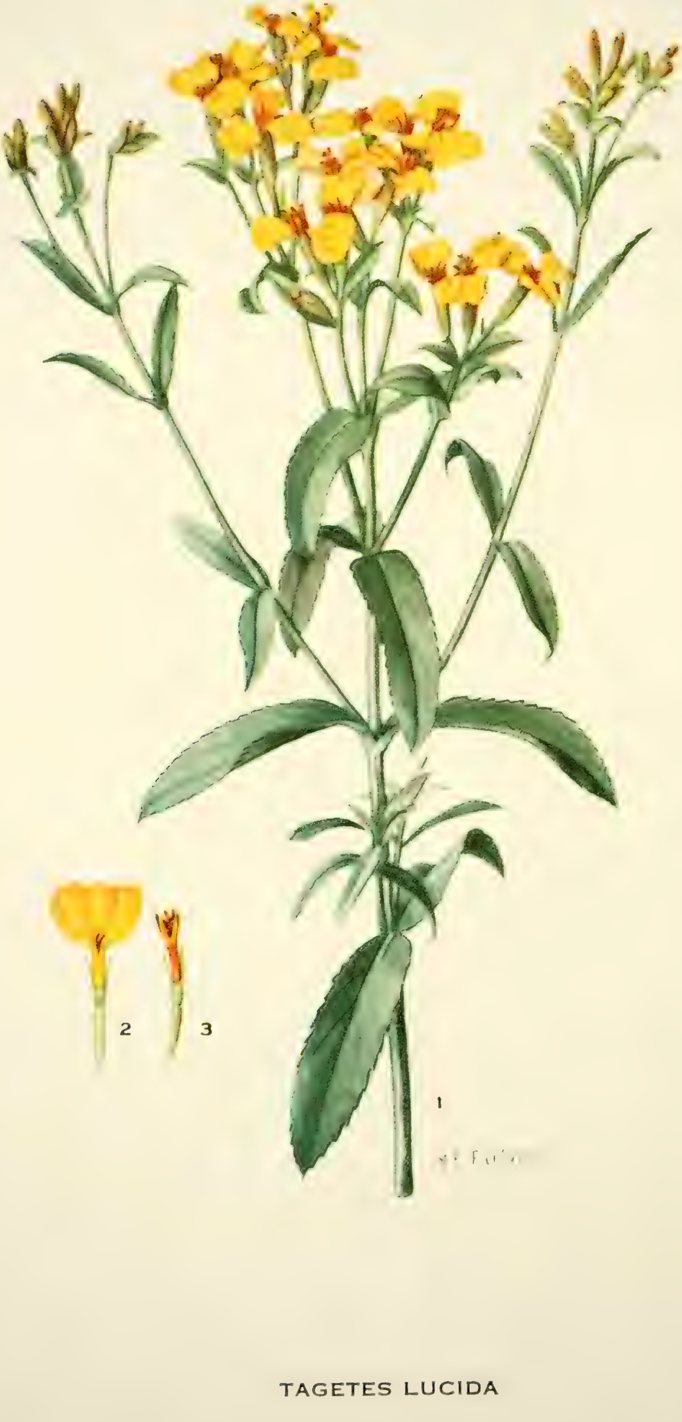
Plants of type variety have been grown on the grounds of The New York Botanical Garden for years and the plant has escaped into the woods and river thickets in several places, where, scrambling over the tops of tall shrubs and into trees it makes quite an attractive appearance, resembling a small leaved grape while in leaf; but when in the fall, the berries which are borne very freely, turn first reddish lilac, then verdigris, and finally a brilliant greenish blue, the resemblance to a grape ceases, but the display of berries is so different from the usual fall colors that their presence is a welcome sight.

The plant may be propagated by seed, or by cuttings, which are best made in September. It deserves to be much better known in cultivation, as its ease of growth and apparently disease free foliage are desirable attributes in a plant so well adapted for covering stone walls, fences, and unsightly buildings.

The Japanese woodbine is a woody, deciduous-leaved vine. The stems are pubescent when young; when older, covered with a thin brown bark. The leaves vary from an inch and a half to about three inches long. The petioles are pubescent and about half as long as the blades. The blades are thin, bright green and dull above, light green and shining beneath, sparsely pubescent on the veins beneath when mature; with a truncate or semi-cordate base, and are orbicular-ovate in outline or variously three-lobed, the margins coarsely crenate-serrate, each crenation tipped by a mucro; the apex of the blade or of each of its lobes acuminate. The inflorescence in borne opposite a leaf and is a pedunculate, dichotomous cyme, each of its branches subtended by a minute ciliate bractlet. The flowers are yellowish green, less than one fourth of an inch across. The calyx is minute, shallowly five lobed. The corolla is five lobed, the lobes valvate, incurved at the tip, lance-ovate, separately caducous. The stamens, as many as the petals, are borne outside of the prominent five-lobed disk. The stigma is at the apex of a short, stout style; the ovary adnate to the disk, two-celled. The fruit is a one to four seeded, somewhat fleshy berry.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Fruiting branch. Fig. 2.—Inflorescence. Fig. 3.—A corolla lobe. Fig. 4.—A stamen.



TAGETES LUCIDA

(Plate 531)

TAGETES LUCIDA

Sweet-scented Marigold

Native of Mexico

Family CARDUACEAE THISTLE Family

Tagetes lucida Cav., Icon. 3: 33. 1794.

The *Tagetes* kinds of marigolds are ordinarily of two kinds, and these kinds have been cultivated for several centuries, or for some few years before the year 1600. They are the African, and the French Marigold, both native of Mexico! The French Marigolds are smaller, spreading, free-flowering, brown and yellow in color, and lasting all summer. The African are taller, long-stemmed, large-flowered and used considerably for cut-flower purposes. The colors are lemon and orange. Varieties of both kinds are visited by certain birds of the late season, and seem to furnish them with seeds as food.

Most marigolds are grown from seed sown in the greenhouse in February or March, and the seedlings transplanted to open ground from flats or boxes. No kind of annual gets such a uniform start, or transplants from flats to the open ground so easily.

The French Marigold is represented in gardens by Legion of Honor and similar varieties of *Tagetes patula.* All of these marigolds are of the strongly-scented kinds. The *Annual African Marigold* is not only shown in gardens by such sorts as Lemon Queen and Orange King, but also in the florists' summer offering of long-stemmed sulphur-yellow and orange blooms.

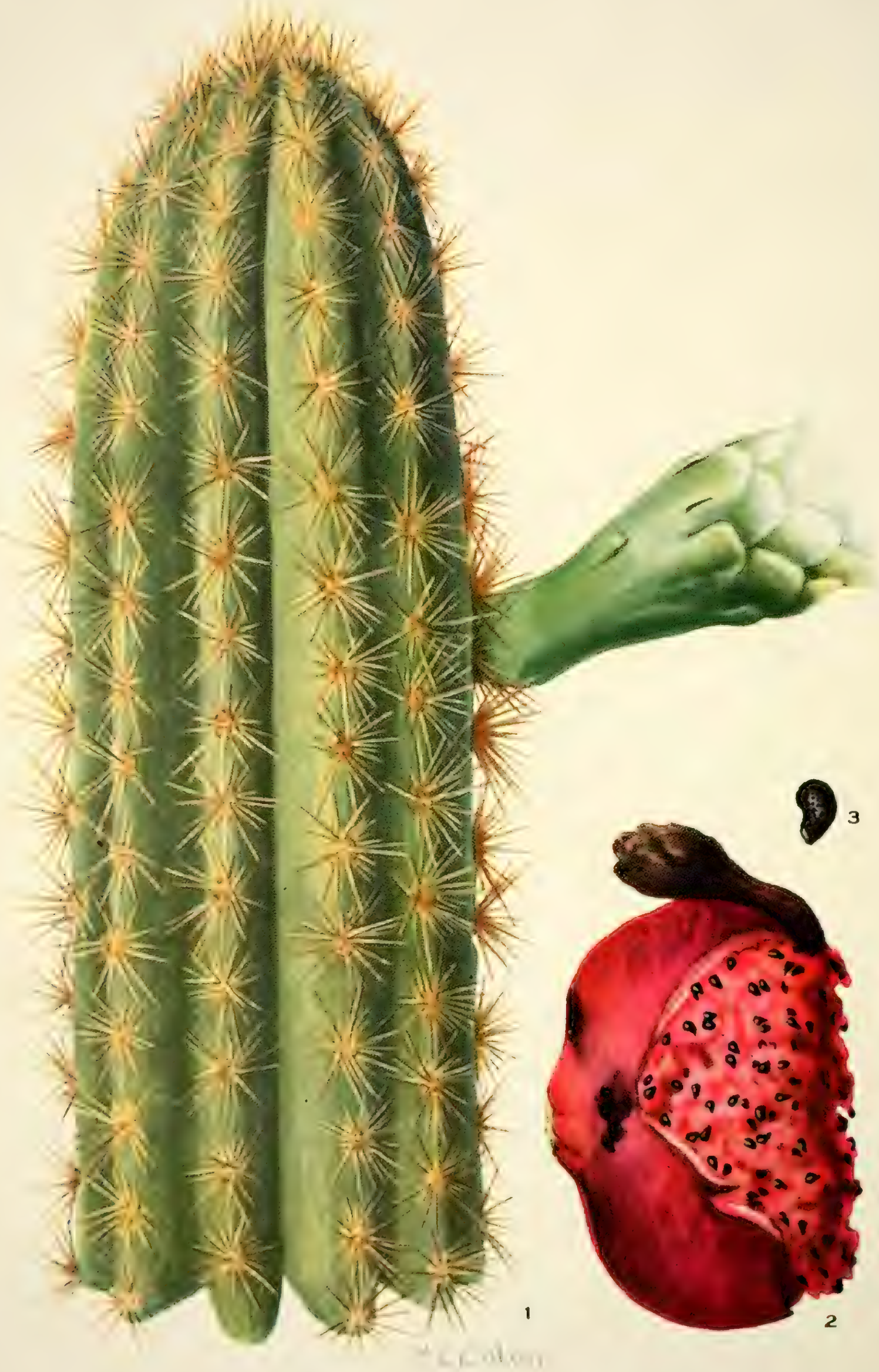
All are best grown from seed sown under glass in March, pinched back and kept stocky and strong, and planted out in late May, so that they will be full of bloom during June, July and August.

The Sweet-scented Marigold is grown, in every respect, in a similar way to that of the ordinary kinds. It differs probably in the size of the flowers, and principally in the feature of the foliage fragrance. This little yellow-flowered annual has leaves which have been occasionally substituted for the well-known vinegar seasoning, tarragon. For herb-growers and for perfume enthusiasts, it is one of the delightful garden annuals which cause one to stop and break off a leaf or two for a quick scent.

The Sweet-scented Marigold is a tender perennial herb, annual in cultivation in this part of the country, with a reddish, smooth, branched stem and opposite, shining, ovate-lanceolate, sessile, serrate, ciliate leaves. The flowers are small, with two or three pistillate or ray flowers and a few disk flowers, perfect, in dense terminal corymbs; each flower surrounded by an involucre with parts united to form a tubular cup with toothed rim. The corollas are yellow, the three or four ray florets with showy, rounded petals, the disk flowers with tubular, five-lobed florets. The seeds are linear-oblong, compressed, and surmounted by a pappus of two to five unequal bristles.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Flowering stem. Fig. 2.—A ray floret. Fig. 3.—A disk floret.



CEPHALOCEREUS DEERINGII

(Plate 532)

CEPHALOCEREUS DEERINGII

Deering's Tree-cactus

Native of the Keys of the Florida Reef

Family CACTACEAE CACTUS Family

Cephalocereus Deeringii Small, Jour. N. Y. Bot. Garden **18**: 201. 1917.

To be confronted with cacti twenty to thirty feet high, growing in scrubby hammocks where soil is practically wanting, is an unusual surprise. Such an uncommon vegetable growth may be met with in walking through the hammocks of some of the islands of the continental shelf of southern Florida. It was first discovered on Lower Matecumbe Key in 1916, the same year it was found on Umbrella Key. The next year it was identified as a member of the flora of Upper Matecumbe Key first from photographs and later by personal observation.

It is confined in its geographical distribution to the coral-limestone keys. Many beautiful plants were found at the above cited localities; but it remained for its more recent discovery on Big Pine Key to bring to light really remarkable growth of this one of the two giants among our eastern cacti. Ancient specimens that have withstood the terrific winds of hurricanes are growing in the hammock on Big Pine Key. They often have stout trunks up to a foot in diameter, which are clothed with bark resembling that of the mahogany, and hundreds of branches.

That this great succulent can grow and thrive on the plate rock of the Key Largo limestone with a very limited amount of humus in place of soil is still more surprising. It can be considered almost an epiphyte, or more strictly speaking it is epipetrinous. As a result of its precarious anchorage, frequent storms and occasional hurricanes blow down most of the growth. Were it not for this condition, what might be its ultimate size? Were it not for the truly cactus-like branches one would not suspect that the trunk was a succulent cactus. A further striking feature is the root-system which is out of all proportion to the aerial growth. How such scant and small roots can produce and maintain the great bulk of the trunk and branches is marvelous. In recent years the axe and the fire-brand has been added to the foes of the tree-cactus. The plant is too succulent to burn, but more or less cooked by the heat and deprived of the mechanical support of the surrounding brush or trees of the hammock, the ancient cactus-trees collapse and topple over.

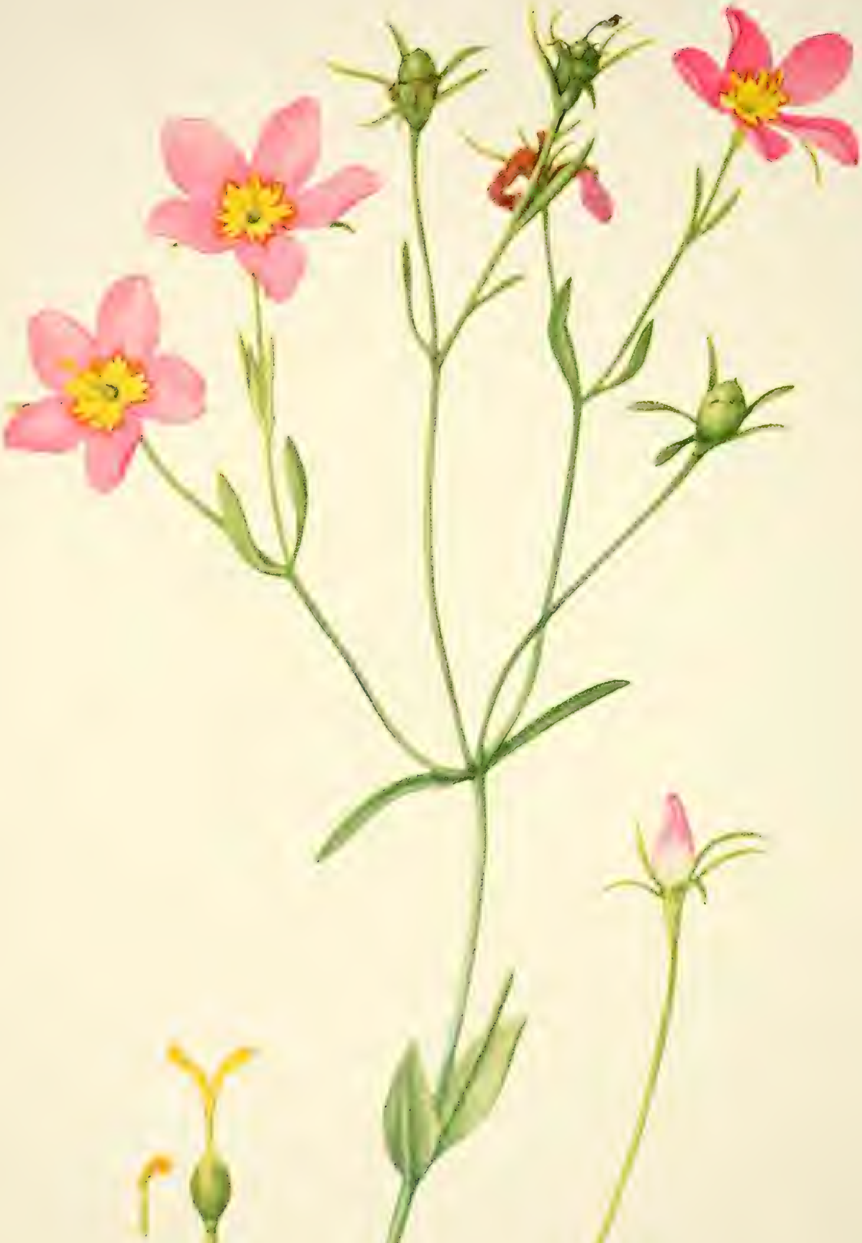
The plant is destitute of leaves, the bark, and perhaps the spines, performing their functions. The programme and performances of the flowers and fruits are interesting. The flowers are borne laterally on the younger parts of the stem and the branches. They open about eleven o'clock in the forenoon and give off the odor of garlic which, perhaps is intended to attract certain insects for the transference of pollen from the stamens to the stigma. The fruits, much depressed apple-like structures, succeed the flowers. They are dull hued without, but finally the fruit-coat bursts, and turns wrong side out showing a brighter coloring and exposing the numerous seeds in a spongy pulp for dissemination by gravity, by the wind, or by birds.

This tree-cactus is characteristic of one geologic formation—the Key Largo limestone. The other tree-cactus of Florida—Cephalocereus keyensis—is characteristic of the Key West oölite. The two geologic formations meet on the front of Big Pine Key, the former partly overlaying the latter. Here, too, the two tree-cacti meet, growing on their respective geologic formations, and mingle with a host of other kinds of cacti—prickly-pears, prickly-apples, dildos, and semaphores.

Deering's Tree-Cactus is a shrub or small tree becoming thirty feet tall, the stem erect, simple or with few erect elongate fastigiate branches forming a very narrow head, or in old plants with very numerous branches, the branches deep-green, usually 10-ribbed. The areolae are very copiously hairy, the hairs rather persistent. The spines are 25–31 together, the longer ones about a half inch long or more. The flowers are about 6 cm. long, narrowly campanulate. The sepals are obovate, obtuse or emarginate. The petals are about a half inch long, clawless, oval, obtuse, erose, scarcely narrowed at the base. The anthers are less than a twelfth of an inch long. The berry is much depressed, two to two and a half inches in diameter, dark-red.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Tip of a branch with a flower. Fig. 2.—Ripe fruit with persistent shrivelled flower attached, partly open showing the seed in the pulp. Fig. 3.—Seed, × 4.



SABBATIA CAMPANULATA

(Plate 533)

SABBATIA CAMPANULATA

Marsh-pink

Native of the eastern United States

Family GENTIANACEAE GENTIAN Family

Chironia campanulata L., Sp. Pl. 190. 1753.
Chironia gracilis Michx., Fl. Bor. Am. 1: 146. 1803.
Sabbatia gracilis Salisb., Parad. Lond. Pl. 32. 1806.
Sabbatia campanulata Torr., Fl. U. S. 1: 217. 1824.

The salt-marshes of the Atlantic Coast have an interesting and more or less distinct flora of their own, the majority of them with mostly inconspicuous flowers, so that when one thinks of a salt marsh, it is of a low-lying sea of vegetation of a few varying shades of green. Several of its inhabitants, however, have fairly attractive flowers, namely the Mallow, *Hibiscus Moscheutos,* one or two species of *Coreopsis,* and the present subject.

Marsh-pinks usually grow in rather close-set colonies, sometimes of considerable extent, but always giving the otherwise dull green marsh the appearance of being studded with pink stars.

The individual flower is quite attractive; its brilliant yellow star-zone at the center, outlined in red, gives it a bright, wide-awake appearance, and it has an unforgettable and wonderfully delicious fragrance.

The beautiful shade of pink these flowers have would make them a fine subject for gardens, but they are rather difficult by reason of marked soil preferences, and must be raised from seed which often fails to germinate. Probably, they had best be enjoyed as they grow in natural state, and we had better seek elsewhere for a garden plant.

The species here illustrated grows in salt marshes and along brackish rivers from Nantucket south to Florida and west to Louisiana. It has also been found in fresh-water swamps, and in the mountain regions of the southern Alleghenies and Blue Ridge, sometimes in rather dry ground.

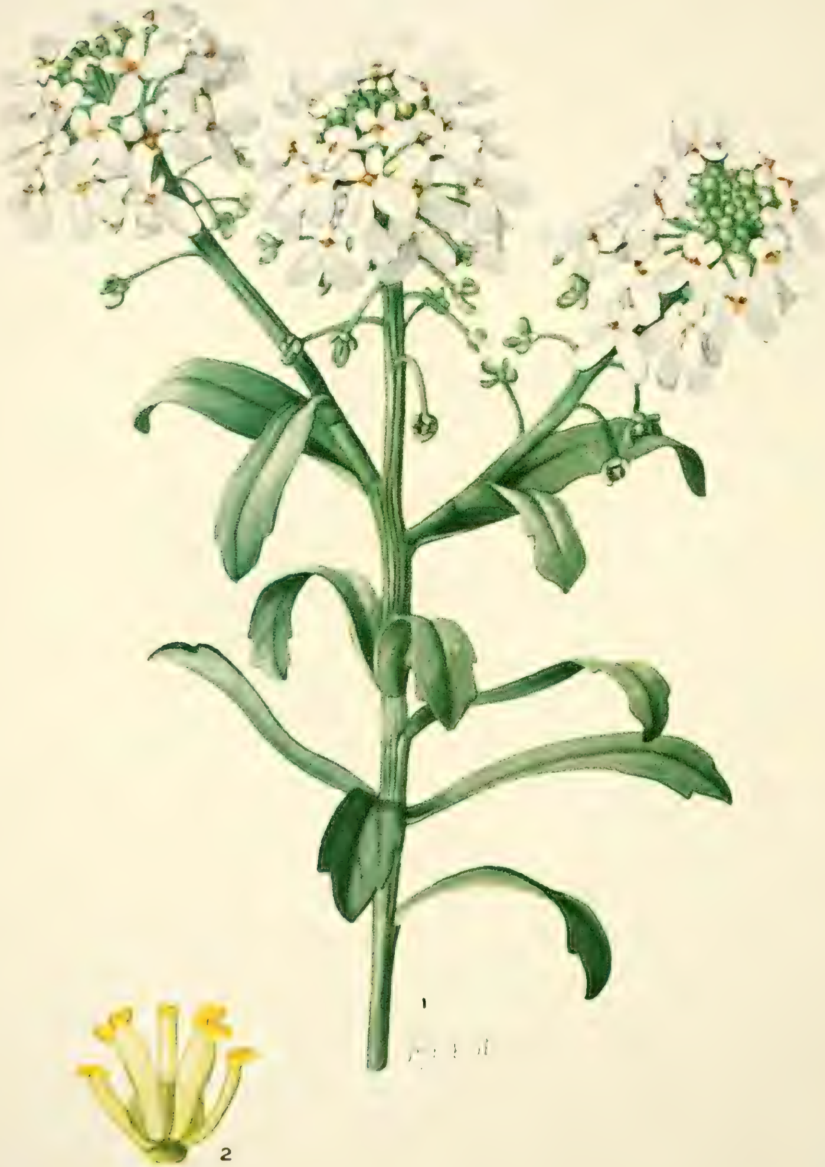
Sabbatia is said to be named in honor of L. and C. Sabbati, Italian botanists.

The Marsh-pink is a slender biennial, six inches to two feet tall, with a much branched stem, the branches alternate. The leaves are opposite below, sometimes alternate above, linear or linear-lanceolate, often ovate near the base, an inch to an inch and a half long, sessile or the lowest sometimes petioled, all bright, light-green.

The flowers, an inch to an inch and a half broad, borne singly at the ends of the branches and peduncles are bright rose-pink with a yellow eye, the eye outlined with a dark reddish pink zone. The five lobes of the corolla are elliptic, slightly obovate, the apex rounded. The five filiform-linear lobes of the calyx vary from fully as long as the corolla-lobes to somewhat shorter in some forms. The stamens are alternate with the petals, the anthers recurving from the tips. The style is two-cleft to the middle, the inner face of each branch stigmatic. The ovary is elliptic. The capsule is obovoid, half to two thirds enclosed in the distended calyx-tube, the calyx-lobes persistent. The seeds are infinitely numerous and minute, brown.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Flowering plant. Fig. 2.—An unfolded bud. Fig. 3.—A stamen. Fig. 4.—The gynoecium.



IBERIS AMARA

(Plate 534)

IBERIS AMARA

Common Annual Candytuft

Native of Europe

Family CRUCIFERAE MUSTARD Family

Iberis amara L., Sp. Pl. 906. 1734.
Iberis coronaria Hort., and varieties.

The most common annual candytufts are of the species *amara,* that is, the white ones. The lavender and mauve varieties however are coming rapidly to the fore as summer-flowering annuals, and they are mostly derived from *Iberis umbellata.* The variety *coronaria,* the Rocket Candytuft, includes the varieties of the white candytuft which are best suited to gardens. The larger and taller sorts are Empress, Spiral White, and Giant Snowflake; the dwarf kinds are Tom Thumb and Little Prince.

The annual candytufts are grown in two ways. An early start is obtained by sowing the seed in February or March indoors, and transplanting the seedlings outdoors in May, when they will bloom about June 15. The centers of the blooming corymbs should be cut out immediately after the first show of bloom is through, then the side branches of the cluster will be allowed to reach their full development. Candytufts may also be grown from seed sown directly in the soil late in May or early in June. Extra seedlings may be thinned out, or may be transplanted with shade and moisture. Home-grown seed may be saved and used the next year, but new seed is preferable.

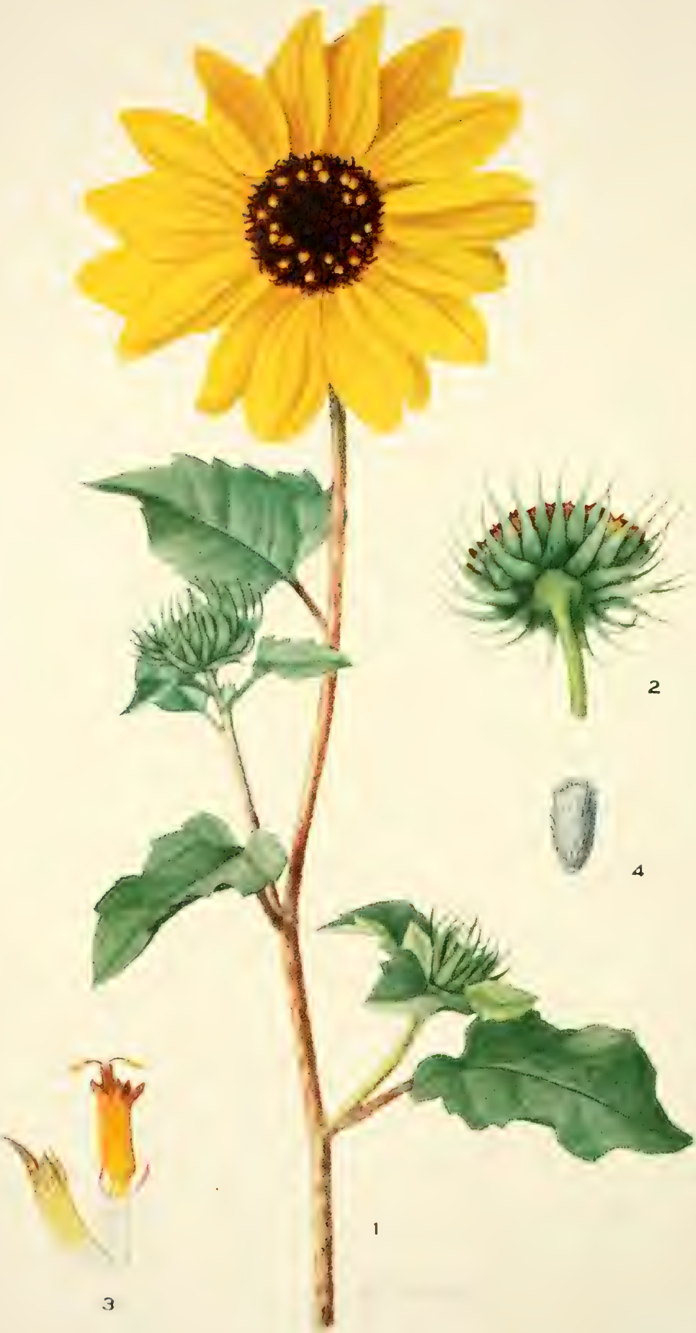
All candytufts like a sunny, open location. The more valuable kinds of candytuft are the perennial, or evergreen species. By far the best is the common Evergreen Candytuft, *Iberis sempervirens,* which is a short shrubby species, for it blooms freely in early Spring, is absolutely hardy, and keeps the garden green all winter. *Iberis corraefolia,* a closely related species, blooms two weeks later and longer, thus completing a four-weeks, and more, blooming season, in addition to the early greenery of leaves.

These evergreen candytufts are best raised from cuttings taken in late September, and rooted in sand in propagating benches, for next season's plants.

The Candytuft of gardens is an annual herb from six to eighteen inches high, weedy in poor soil but robust and floriferous in rich garden soil. The leaves are alternate, lanceolate to oblanceolate and variously toothed at the apex. All green parts of the plants are bitter and nauseous, though formerly used in medicine. The flowers are borne in rather dense corymbs, but the clusters in cultivated varieties elongate considerably in fruit and become racemes. The flowers of this species are ordinarily white, with four petals, the outer flowers of the corymb usually with the outer two of the four petals enlarged and more showy, that is, the outer flowers of the corymb are more irregular. The seed-pods are compressed. orbicular, emarginate, and contain several ovate pendulous seeds.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. **Fig. 1.—Flowering stem. Fig. 2.—Corolla removed, showing relation of stamens and pistil.**



HELIANTHUS CUCUMERIFOLIUS

(Plate 535)

HELIANTHUS CUCUMERIFOLIUS

Cucumber-leaved Sunflower

Native of Texas and Louisiana

Family CARDUACEAE THISTLE Family

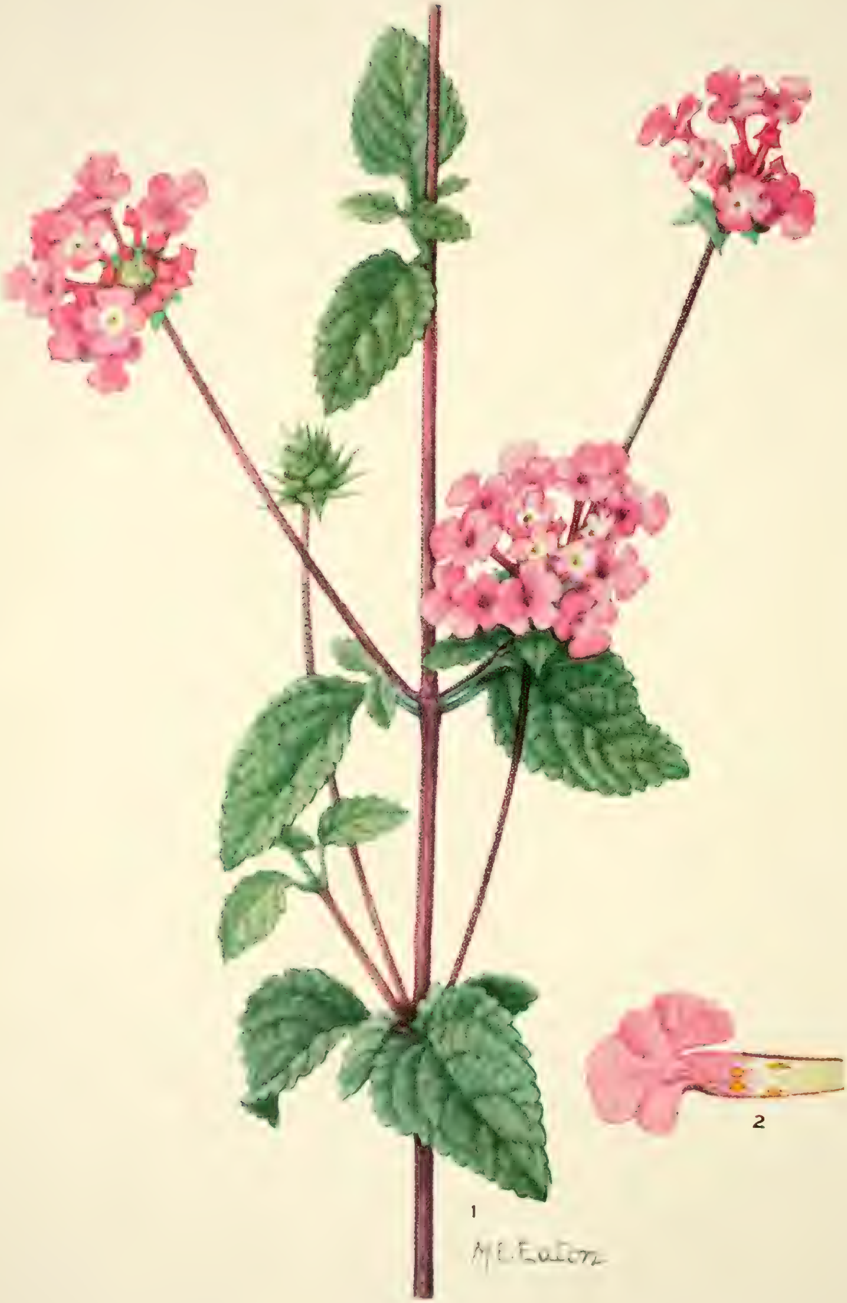
Helianthus cucumerifolius T. & G., Fl. N. Am. 2: 319. 1842.
?*Helianthus Lindheimerianus* Scheele, Linnaea 22: 159. 1849.
Helianthus debilis var. *cucumerifolius* (T. & G.) Gray, Syn. Fl. N. Am. 1²: 273. 1884.
Helianthus debilis var. *plumosus* Hort.
Helianthus debilis var. *purpureus* Hort.

This handsome little sunflower is a native of Texas and adjacent Louisiana, although it has likewise been introduced into Missouri, Florida, Bermuda, and Cuba and is there becoming naturalized. The species has been very widely confused with *H. debilis* Nutt. and is erroneously considered to be conspecific with this species by many standard authors. It differs conspicuously, however, from *H. debilis* in its erect growth and purple-mottled stems and in its usually much longer peduncles and more conspicuously serrate leaf-blades. In its native haunts it inhabits sandy fields near the coast and open woods farther inland, while *H. debilis* is primarily a beach- and dune-inhabiting plant of prostrate habit, with only the tips of the stems and branches slightly ascending, with perfectly green stems, and with mostly shorter peduncles and less conspicuously serrate leaf-blades. Other differences between the two species, such as the comparative length of the ligules and of the tips of the receptacular bractlets (or chaff), are noted by some authors, but do not appear to be sufficiently constant characters to be admitted as of diagnostic value. It has been collected in flower during almost every month of the year, but is primarily a summer and early fall bloomer. The species is frequently met with in cultivation, where forms are to be found with the ray-florets ligulate, varying from pale to deep yellow, and with the disk-florets varying in color from light pink to deep purple.

The cucumber-leaved sunflower is an annual herb with erect, branching stems 1–2 m. tall. Its stems are conspicuously purple-mottled and more or less sparsely hispid-pilose or merely scabrous. Its branches are slender and ascending, issuing mostly from above the middle of the stem. The leaves are mostly alternate, but the lowermost are occasionally opposite. The petioles are very slender and on large leaves are about 1–7 cm. long. The dark green blades are deltoid or deltoid-ovate, 3–8 cm. long and 2–5.5 cm. wide, acute or acuminate at the apex, cordate or subtruncate at the base, with the margins usually more or less sharply and irregularly serrate, strumose-setose above, and scabrous-hispid beneath. The peduncles are usually much elongated, 10–37 cm. long, bearing 1 or more small deltoid leaves near the base and frequently a few small peduncular bracts farther up, and terminated by a single head of flowers. The peduncular bracts, when present, are lanceolate or ovate, 1–4.5 cm. long, and 4–16 mm. wide. The involucral bracts are ovate-lanceolate, 10–20 mm. long, widened below, abruptly attenuated into a long lanceolate apex which terminates in an elongated filiform or caudate tip, rather lax, scabrous, and faintly short-ciliate, surpassing the disk. The (normally) yellow ray-florets are about 14–23 in number, the ligules being 17–30 mm. long, 4–10 mm. wide, and obtuse or subacute at the apex. The disk in expanded heads is 2–2.5 cm. wide, its florets with a yellowish and glabrate corolla-tube and dark red-purple lobes. The receptacular bractlets (or chaff) are 3-lobed at the apex, the central lobe being linear-lanceolate or subulate and usually prolonged into an elongate, filiform or caudate tip. The achenes are oblong and densely clothed with appressed-villous hairs.

HAROLD N. MOLDENKE.

EXPLANATION OF PLATE. Fig. 1.—Flowering spray. Fig. 2.—Flower-head with the rays removed to show involucral bracts. Fig. 3.—A disk floret and its subtending bractlet (chaff). Fig. 4.—An achene.



LANTANA SELLOWIANA

(Plate 536)

LANTANA SELLOWIANA

Weeping Lantana

Native of South America

Family VERBENACEAE VERVAIN Family

Lantana Sellowiana Link & Otto., Ic. Pl. Sel. Berol. 107. 1828.

Any one having a window-box or a garden to which not much attention can be given and wishing an easy flowering plant not easily affected by city air should get acquainted with the various species of *Lantana.* Of these, of course the commonest and most showy is *L. camara* with flowers opening yellow or cream and turning pink or red, white forms also occurring, but the subject of this sketch is fully as free flowering and is a somewhat hardier plant, though not quite so common.

Lantana Sellowiana is quite commonly cultivated in the south, where it is used very often for hanging baskets and porch boxes. In Florida it has escaped into waste places and along roadsides, as also have several other species, where they form attractive masses of color to please the eye of the passer-by.

Lantanas are easily raised from either seed or cuttings, though the seeds germinate somewhat slowly.

As bedding-out plants, they are of course unexcelled, and form a constant succession of bloom throughout the year in the south and also in the north, though they must be taken indoors during cold weather, but will continue to flower there if given sufficient light.

The species here illustrated is a native of South America, but has long been in cultivation and has developed several horticultural forms.

The leaves or stems of many species have a juice which is poisonous to the skin of some people; and the somewhat "fishy" odor of the leaves has put these plants into disfavor in many sections.

This species was named after Dr. Friedrich Sellow, German traveller in Brazil for fifteen years, who died in 1831.

The weeping *Lantana* is a perennial shrub in southern climates, with a weak, reclining or trailing stem, the branches pubescent. The leaves are about one inch long, dark green, pubescent: the blades are ovate, abruptly narrowed to a short petiole, rugose and coarsely toothed. The inflorescence is a long-peduncled head, borne just above the leaf-axil. The flower head is one or two inches across, the flowers each subtended by a conspicuous pubescent bract, the outer of which are broad ovate, the inner somewhat narrower. The calyx is very small, completely concealed by the floral bracts, ciliate, the lobes little more than undulations. The corolla is salver-shaped, usually some shade of lilac or reddish-purple, often with a white eye. The tube is nearly one half inch long, pubescent without, as is the limb, which is somewhat irregularly lobed, about a fourth of an inch or slightly more across. The four stamens are adnate to the corolla-tube, and are arranged in pairs at about the middle. The stigma is oblique on the filamentary style. The ovary is two-celled, with the ovules solitary in each cell. The fruit is a fleshy, purplish drupe, containing two one-seeded nutlets.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Flowering branch. Fig. 2.—Corolla, laid open to show attachment of stamens.

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PLATE 506. CLINTONIA BOREALIS
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PLATE 508. CHEIRANTHUS ALLIONII
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ADDISONIA

COLORED ILLUSTRATIONS
AND
POPULAR DESCRIPTIONS
OF
PLANTS

VOLUME 16 NUMBER 4

DECEMBER, 1931

PUBLISHED BY

THE NEW YORK BOTANICAL GARDEN

(ADDISON BROWN FUND)

DECEMBER 1, 1931

ANNOUNCEMENT

A bequest made to the New York Botanical Garden by its late President, Judge Addison Brown, established the

ADDISON BROWN FUND

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The preparation and publication of the work have been referred to Mr. Edward Johnston Alexander, Assistant Curator, and Mr. Kenneth Rowland Boynton, Head Gardener.

ADDISONIA is published as a quarterly magazine, in March, June, September, and December. Each part consists of eight colored plates with accompanying letterpress. The subscription price is $10 annually, four parts constituting a volume. The parts will not be sold separately.

Address:

THE NEW YORK BOTANICAL GARDEN
BRONX PARK
NEW YORK CITY

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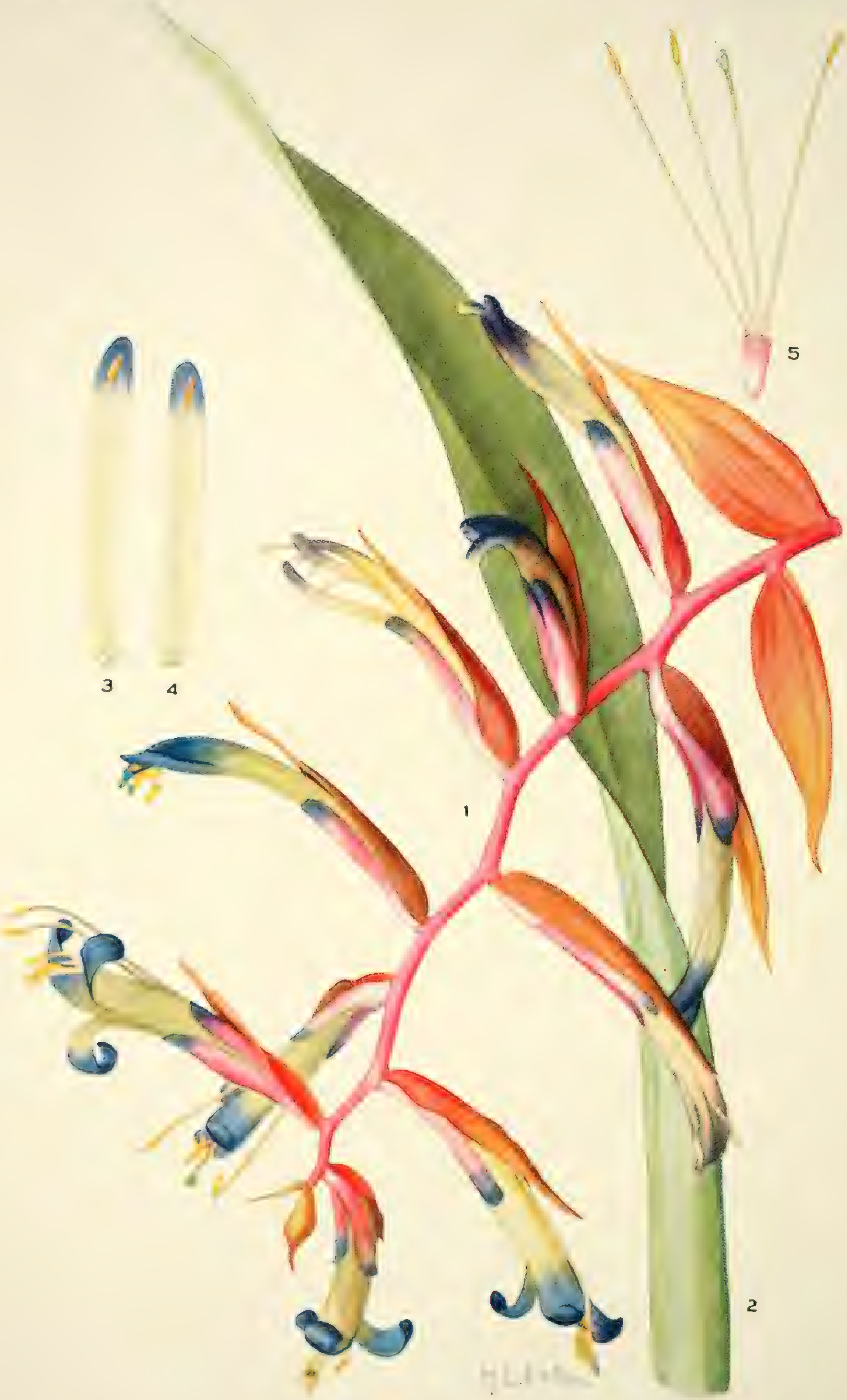

BILLBERGIA IRIDIFOLIA

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(Plate 537)

BILLBERGIA IRIDIFOLIA

Drooping Billbergia

Native of Brazil

Family Bromeliaceae Pineapple Family

Billbergia iridifolia **Lindl. Bot. Reg.** ***pl. 1068.*** **1827.**

Those city dwellers who possess neither gardens nor gardening space, and yet thirst for floral beauty in their homes, should welcome the knowledge of such a family of plants as the Bromeliads. Nearly all of the family are epiphytic, and unlike orchids adaptable to the hot, close air of a city home.

The genus *Billbergia* is one of the most beautiful and easily grown of the family, many of its species having mottled leaves, and flower stalks with red bracts and yellowish and blue flowers.

The species here illustrated seems to have been first seen in cultivation in 1826 in England where it had been sent from Rio de Janeiro, having been found as an epiphyte on trees. The following year it was first figured and described.

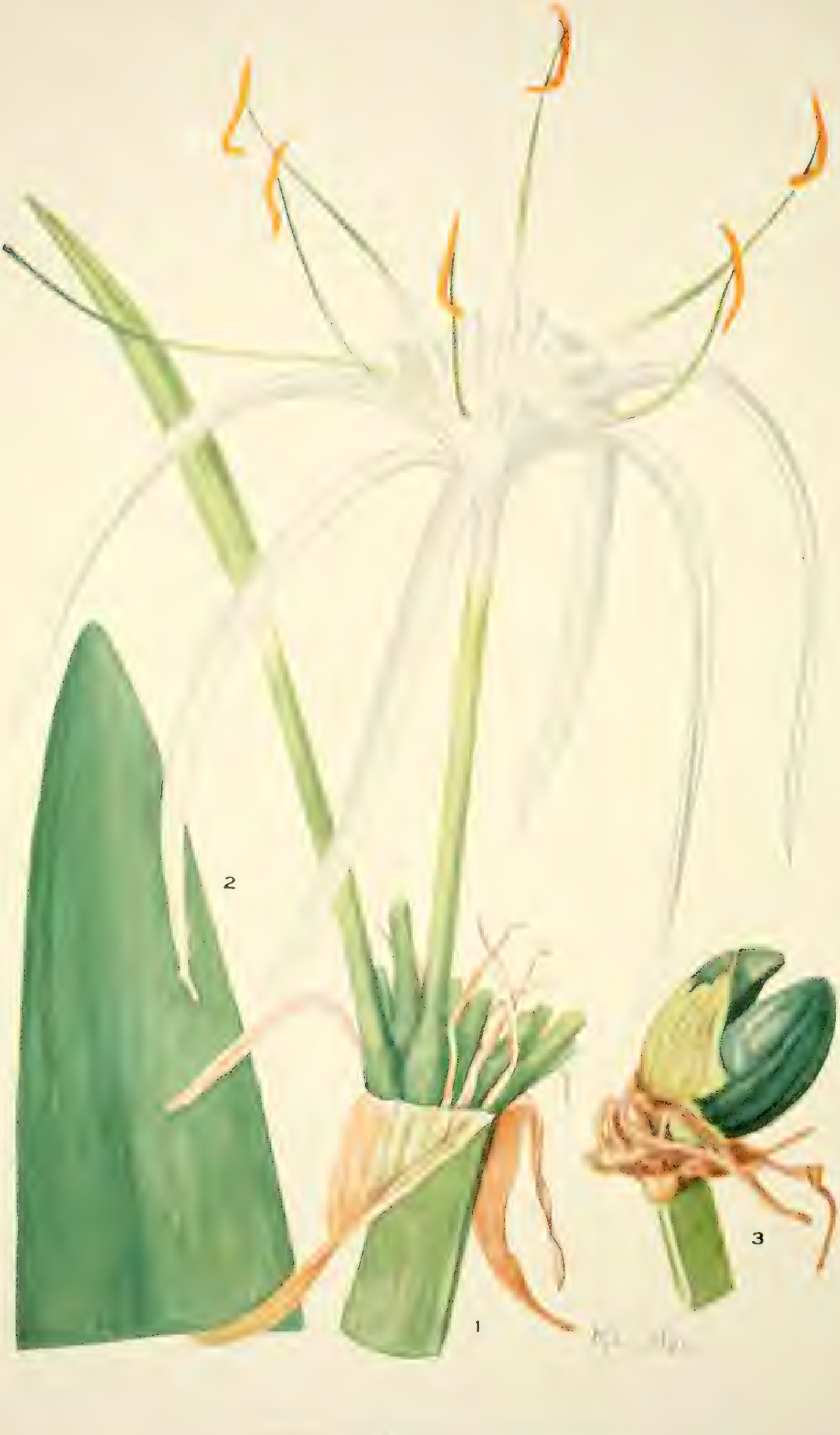
For cultivation, these plants prefer to be planted in easily drained vessels with loose material such as charcoal or fern roots about their base. A light sprinkling of water during the winter is about all they require as food, but they must have plenty of sunlight and a temperature of not less than 50° at night. In the spring and summer, with a little water poured into the cupped bases of the leaves they can stand any amount of heat. They are propagated from suckers or sprouts that arise at the base of the old plant which dies after flowering.

B. iridifolia is said to have tonic, expectorant and slightly cathartic qualities. A tea made from the leaves has been used in pulmonary and other lung troubles, for which purpose the tea must be mixed with brandy and sugar. The natives in South America are said to prepare a delicious drink by distillation of the entire plant, obtaining a liquid similar in appearance to the juice of sugar maple (*Acer saccharinum*), but not conveniently convertible into sugar.

The drooping billbergia is an epiphytic herb, with a short stem covered by closely set leaves forming a rosette, and with their bases cupped. The leaves are from one and a half to two or three feet long, tough and hard, dark green above, somewhat scurfy beneath, strap-like, with an acuminate tip and undulate margin, sparsely set with minute spiny teeth near the base. The inflorescence is a loose, drooping raceme, the entire rachis of which is bright rosy red, with several coralline bracts below the flowers and one subtending each individual flower. Each flower is from two to two and a half inches long. The three sepals are coral-pink, tipped apically with sky blue. The three petals are greenish yellow, becoming sky blue towards the rounded recurved apex; linear, convolute towards the base, where each bears two nectar-glands. The six stamens are exserted on slender white filaments. The stigma is three parted, convolute; the style filiform; the ovary inferior, three-celled and many ovuled. The capsule is berry like, the seeds naked.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Flower spike. Fig. 2.—A leaf. Figs. 3, 4.—Petals, showing the attached stamens and the nectar-glands at the base. Fig. 5.—Three stamens and the gynoecium.



HYMENOCALLIS CAYMANENSIS

(Plate 538)

HYMENOCALLIS CAYMANENSIS

Cayman Spiderlily

Native of the Cayman Islands

Family AMARYLLIDACEAE AMARYLLIS Family

Hymenocallis caymanensis Herb. Amaryllidaceae 214. 1837.

Among the groups of plants which have long been favorite glasshouse subjects in the North and outdoor plantings in the South, the spiderlilies stand in the front rank. They are, in most cases, easy to grow, and when established in a plantation, colonies will not only perpetuate themselves indefinitely, but will multiply to an extraordinary extent. Such colonies furnish sources of supply for commercial purposes, either through sale or exchange.

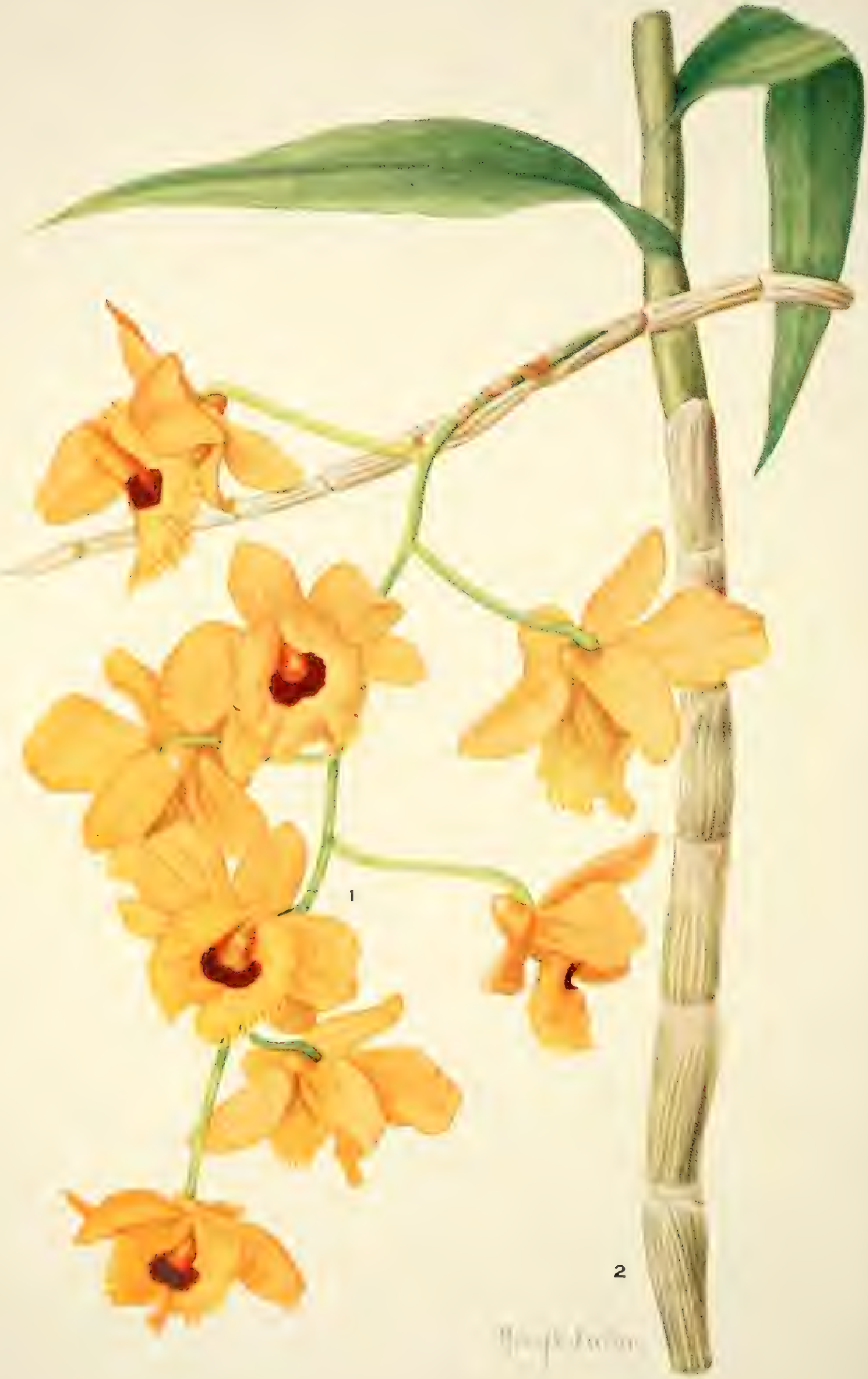
Many of the species are closely related, as far as specific characters are concerned. As memory in such cases may be short, descriptive ideas may become confused, collections of bulbs being replanted or exchanged may become mixed or mislabelled, and herbarium specimens being for the most part nearly or quite worthless for classification purposes, confusion results. Much documentary evidence on this line may be seen by a casual survey of the synonymy of the various species of the genus. The histories of the species of monocotyledonous succulents is similar to this, many of them showing a much greater degree of confusion. There is one way, however, by which such confusion among the plants with ephemeral, even evanescent, flowers may be prevented. Paintings, of a character similar to the one accompanying this note, made from type specimens or from specimens collected at type localities are the only records of value, and constitute the only means of getting at an understanding of the various species of this genus and of the species of other genera with flowers of the character just referred to. One of the Florida species of *Hymenocallis* has long been associated with the binomial *Hymenocallis caymanensis*. Being suspicious that the Florida and Cayman plants might represent different species, we secured bulbs of the Cayman Island spiderlily through the kind offices of the Honorable Herbert H. Cousins of the Department of Agriculture of Jamaica, West Indies. The bulbs reached the Garden in 1924 and flowered for the first time in the Propagating Houses in 1926 when the painting for the accompanying illustration was made.

This species doubtless occurs on other West Indian Islands such as Cuba, Jamaica, and Hispaniola. In fact, herbarium specimens have been distributed under the name *H. caymanensis,* from these islands, but their identity is doubtful.

The Cayman-spiderlily has an erect bulb with an ovoid or globose-ovoid body up to four inches in diameter and a cylindric neck often becoming as long as the body of the bulb and one and a half to two inches thick. The several leaf-blades arise at the top of the bulb-neck and are distichously recurved-spreading, strap-shaped, mostly two to two and a half feet long, deep-green, glabrous, shallowly channeled above, bluntly ridged beneath along the midrib, mostly twenty-seven to thirty-seven-ribbed, acute, lunate in cross-section near the base. The scape is erect, usually one and a half to two feet tall, much flattened and sharply two-edged, especially above, glaucescent. The flowers are borne in a terminal cluster of nine to twelve, subtended by an involucre of two lanceolate bracts three to four inches long, they are very fragrant and open usually two or three at a time. The hypanthium is four to five inches long, obscurely three-sided, pale-green below, white and somewhat six-ridged at the top. The perianth is white, the elongate parts recurved. The three sepals are very narrowly linear, as long as the hypanthium or nearly so, with the apical horn-like appendage greenish-white. The three petals are slightly wider than the sepals and white at the tip, but otherwise similar. The crown is short-stalked, the limb about one inch wide, nearly circular in outline, but with the unevenly toothed or notched lobes between the filaments forming an obscure hexagon. The six filaments are one and three quarters to two inches long, white at the base, greenish-brown above the middle. The anthers are dark-yellow, about three-quarters of an inch long. The exserted part of the style is colored like the filaments. The stigma is minute. The capsules oval or ovoid, sometimes nearly globose, an inch and a quarter to an inch and a half long, bright-green. The seeds, two or three in a capsule are nearly ellipsoid, but flattened on one side, deep-green.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Inflorescence with an open flower. Fig. 2.—Tip of a leaf. Fig. 3.—Ruptured capsule with seeds protruding.



DENDROBIUM FIMBRIATUM OCULATUM

(Plate 539)

DENDROBIUM FIMBRIATUM OCULATUM

Spotted Fringed Dendrobe

Native of Northern India

Family ORCHIDACEAE ORCHID Family

Dendrobium fimbriatum oculatum Hooker, Bot. Mag. *pl. 4160.* 1845.

The genus *Dendrobium* contains orchids of the Eastern Tropics, six hundred species and many hybrids. Dendrobiums are one of the useful groups of orchids in the conservatory where a mixed collection of plants is grown. Although many kinds require special attention, they are usually of easy cultivation. They ordinarily should be given a high temperature and moist atmosphere in summer, and a cool and dry one in winter, so that the plants may then have the rest needed to prepare them for the next season's bloom.

The group of golden-yellow dendrobiums known to orchid-growers contains many beautiful spring-bloomers. *D. fimbriatum oculatum* is a form of the evergreen fringed dendrobe from Nepal in India. It was discovered in Northern India by a Mr. Gibson. Of all of these golden-yellow dendrobes it is perhaps the most striking, with racemes, sometimes eight to ten inches long, of pendulous lasting flowers, rich golden in color, each with a large blotch of blackish crimson at the base of the lip, which is deeply fringed. The flower spikes are produced in March and April.

Dendrobiums are best grown in fern-root and sphagnum, in small pots or baskets. They require strong heat and much moisture for flowering, and after blooming should be ripened carefully by removing to a lower temperature and by decreasing the supply of moisture, allowing plenty of light and air. In spring they should be returned to more heat and moisture for the blooming season.

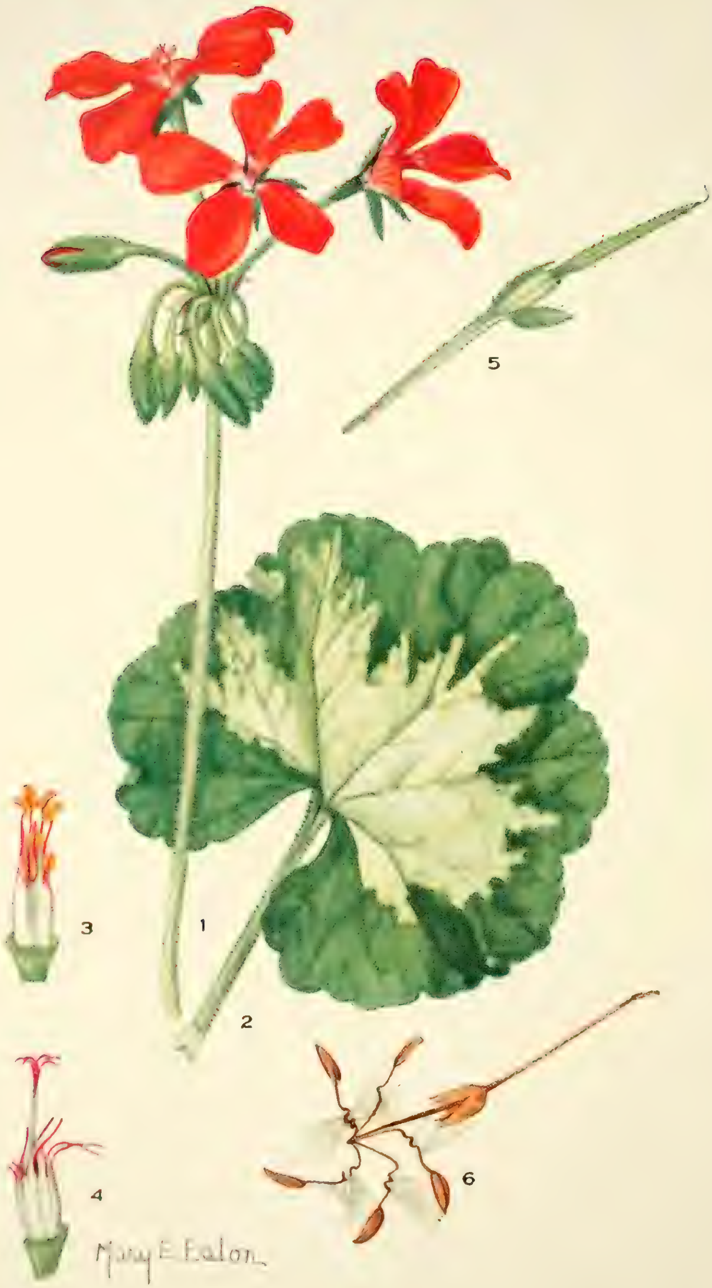
Others in the group of golden yellow dendrobes known to orchid-growers are *D. chrysanthum* from Burma, which is like *D. fimbriatum oculatum* but paler; *D. aureum* from the East Indies, noted for the fragrance of its cream colored blooms; *D. densiflorum* from the Himalayas, famous for the size of flower-clusters on plants grown for display, and *D. chrysotoxum* from Moulmein.

Propagation is best effected by division of old plants.

Dendrobium fimbriatum oculatum is an evergreen orchid with tufted, slender pseudobulbs, from three inches to two or three feet long, light green but covered with straw-colored leaf sheaths. Each pseudo-bulb bears up to twenty-four alternate, oblong-lanceolate, clasping, acuminate leaves, which are about six inches long. The racemes are pendulous from the top of the ripened stems, each bearing from six to twelve blossoms. The flowers are from two to three inches across. The sepals and petals are broad and spreading, thick, the petals slightly toothed at the edges, the two lateral sepals being joined at the base to form a lip or chin. The lip is large and hooded, of a slightly paler color than the petals and sepals, with a darker spot in the center and a mossy fringed margin.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. **Fig. 1.—Flowering raceme. Fig. 2.—Leafy stem.**



PELARGONIUM ZONALE CLON HAPPY THOUGHT

(Plate 540)

PELARGONIUM ZONALE CLON HAPPY THOUGHT

Happy Thought Pelargonium

Of Horticultural Origin

Family GERANIACEAE GERANIUM Family

Pelargonium zonale clon Happy Thought Hort.

The Happy Thought Pelargonium was evidently first exhibited at the Pelargonium Show of the Royal Horticultural Society held in London July 16–17, 1873. Reports of this show (Journal of Horticulture, **50**: 43–44, July 17, 1873, and Gardener's Chronicle **38**: 984–985, July 19, 1873) state that three plants of Happy Thought exhibited by Messrs. Bell and Thorpe received first prize in the class of "new Nosegay or hybrid Nosegay" Pelargoniums. This plant was described as having a "greenish white center with a broad margin of green." Another reference to the Happy Thought Pelargonium was published in 1875 (The Garden **8**: 428) in which it is stated that "this is one of the prettiest of all the variegated kinds, and is quite distinct from all others, the leaf having a distinct creamy-yellow center and a green margin." The next year (The Garden **9**: 306) it is recorded that this pelargonium arose, not as a seedling but as a sport, from the old Pelargonium Magenta, and that it was obtained by a gardener in Warwick.

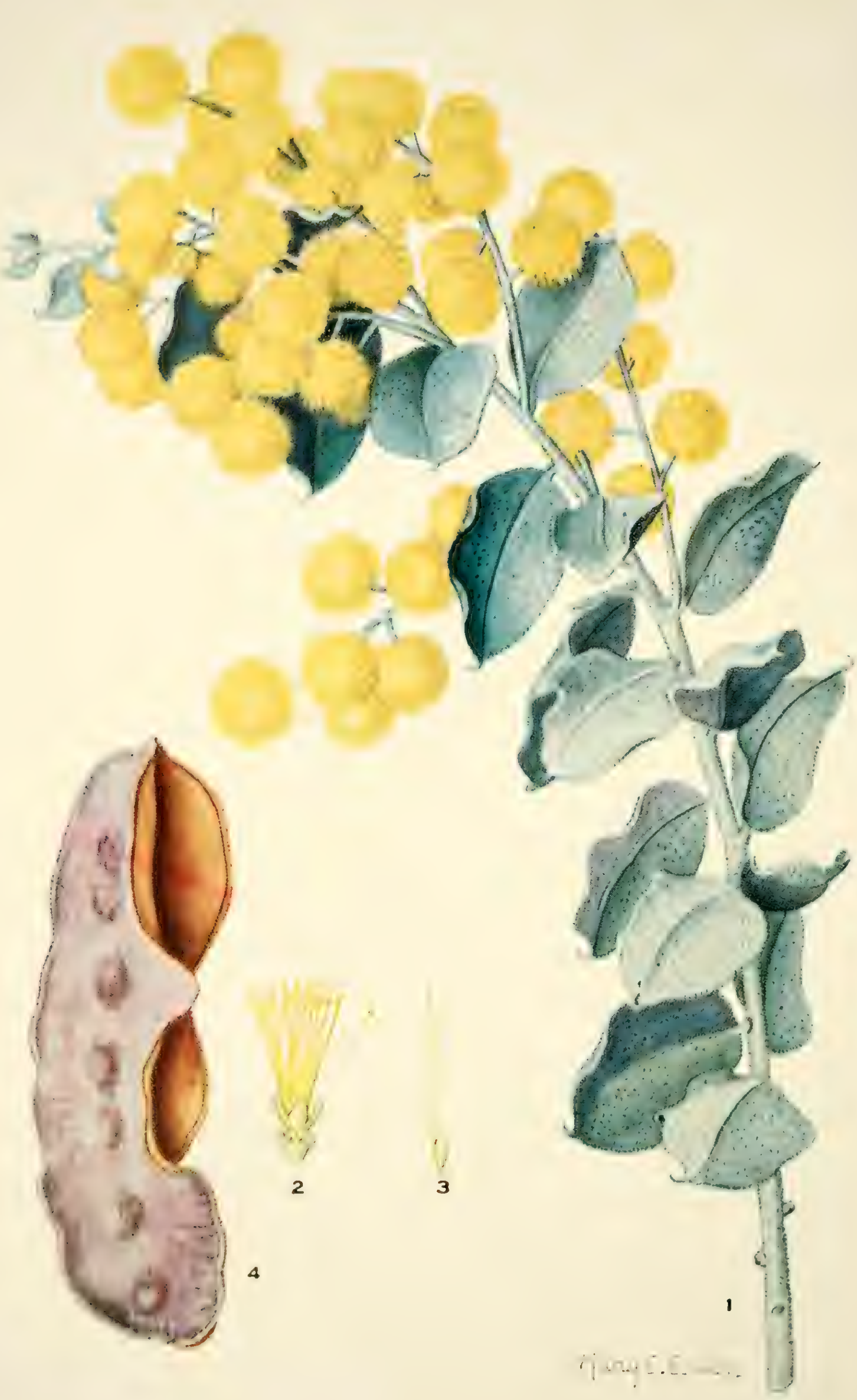
Variegated pelargoniums share with other variegated plants in horticultural uses, and there has also been much investigation and speculation regarding the nature of such plants and the processes involved in their origin. The most important of these may be noted here. In 1909 Dr. E. Baur, a noted German geneticist, reported and demonstrated (Zeits. f. ind. Abst. u. Vererbungslehre **1** : 330–351) that certain white-bordered or albomarginate pelargoniums are composed of definite layers of white cells which surround a core of green cells. This arrangement exists in the tissues of the growing points of the stem and as long as this persists the relative position of the green and white cells is maintained in the development of the leaves. The name *chimera* was applied to a plant which is composed of two inherently different kinds of cells. At the present time numerous chimeras are known in plants and there are several types in respect to the arrangement of the two kinds of tissue. At first consideration there appears to be some difficulty in recognizing that the Happy Thought Pelargonium is a chimera composed of layers of green cells surrounding a core of yellow cells. The central area of yellow extends from surface to surface in the blade of the leaf and does not appear to be covered with a layer of green cells continuous with those of the margin. But the suggestion has recently been made by Mr. R. J. Chittenden (Bibliographia Genetica 3 : 355–442) that in this plant the central core of yellow cells has a bleaching effect on the green contents of the cells directly covering them. According to this view, the Happy Thought Pelargonium is a periclinal chimera composed of an inner core of yellow cells which exerts a bleaching influence on the overlying green cells, especially in the central portion of the leaf. Not infrequently pure green branches arise on plants of Happy Thought and also pure yellow branches occasionally arise. This supports the view that two kinds of cells are present in the plant and that in the mechanical adjustments in the growing points only one kind of tissue may occasionally be included in a branch. Also the central area becomes paler and almost white as a leaf ages.

Plants of the Happy Thought Pelargonium are herbaceous, of a semi-dwarf habit of growth, and with usually numerous branches of a somewhat bushy, erect disposition. The leaves are alternate, entire, reniform, strongly cordate, and sparingly covered with short hairs as are the peduncle and calyx of the flowers. The leaves show a band or ''horseshoe'' of the darker coloring characteristic of the ''zonal'' class of pelargoniums, but this zone is mostly faint or absent in the area of yellow. The clon thus appears to be definitely related to the wild species known as *Pelargonium zonale.* The flowers are numerous in an umbel-like inflorescence. The individual flower is single, the five petals almost bright scarlet; there are five sepals; five lobes to the pistil; usually seven pollen-bearing stamens and three that are rudimentary. There is a conspicuous nectar-tube extending along the pedicel and adherent to it which is a modification of the base of a dorsal sepal. The arrangement of the flower parts is irregular, with the two upper petals erect and somewhat more narrow than the three lower ones. The flowers are protandrous to a degree which almost completely prevents self-pollination, but close-pollination is possible and this will give fruits and viable seeds. The fruit is dehiscent, the one-seeded carpels splitting elastically from a beak-like axis. At maturity the five segments coil in hygroscopic action and expose pappus-like structures which are adaptations for seed dispersal.

As a horticultural clon the most distinctive feature of the Happy Thought Pelargonium is the conspicuous variegation in the leaves, well illustrated in the accompanying plate.

JEAN KERR.

EXPLANATION OF PLATE. Fig. 1.—Flower-spray. Fig. 2.—Leaf, showing variegation. Fig. 3.—Stamens × 3. Fig. 4.—Pistil × 3. Fig. 5.—Green fruit, showing nectar spur. Fig. 6.—Fruit at maturity.



ACACIA PODALYRIAEFOLIA

(Plate 541)

ACACIA PODALYRIAEFOLIA

Pearl Acacia

Native of Australia

Family MIMOSACEAE MIMOSA Family

Acacia podalyriaefolia **A. Cunn. in Don. Gen. Syst. 2: 405. 1832.**

Acacia is a genus of plants variously understood and interpreted, but considered by the horticulturist generally to refer to the great Australian group containing nearly four hundred species, of which a select group is cultivated outdoors in the mild climates of California and Florida, and in greenhouses in other places. These Australian Acacias or Wattles are among the showiest of late winter and early spring flowering plants for conservatories. They are usually grown in pots or tubs, but where space is available they do better if planted out directly in the ground. They are not easily transplanted, but should remain in permanent position, where, by an annual pruning back immediately after flowering, they are made to bloom profusely each season. The usual popular kinds are the feathery-leaved *A. dealbata,* the Silver Wattle, *A. pubescens,* the Hairy Wattle, with silvery foliage and fluffy yellow flower-clusters, and many kinds without leaves but with phyllodia may appear in collections, though kinds like *A. longifolia floribunda,* the Gossamer Wattle, and *A. armata,* the Kangaroo Thorn, are commonly grown.

Several acacias have a tendency to send out long, slender shoots and may be trained on pillars or posts, or to the rafters of conservatories. *A. podalyriaefolia* may be thus treated, and when the heavy, fragrant clusters cover the pendant ends of the long growths it approximates the beauty of any vine in greenhouse cultivation. From such a specimen which filled a corner of the Central Display House, Conservatory No. 2, New York Botanical Garden with bloom every season from 1919 to 1925, the illustration for Addisonia was made. The Garden has received new specimens from the collections of Wm. H. Webster, Great Barrington, Mass., and Mr. H. Huebner, Groton, Mass.

Thus it will be seen that this acacia is not one of the best for compact flowering commercial or exhibition plant work but is perhaps the most beautiful for permanent conservatory decoration. If cut to a loose-jointed bushy model, its grey foliage, sulphur-yellow flowers, and delightful fragrance are characteristics found combined in only a few of the better florists' acacias.

Acacias are bloomed for the winter from Christmas to April. They thrive in a soil of loam and leaf-mold with a little sand added, require an abundance of water at all times, and need a cool or temperate house, from 55° to 60° F., for their best development.

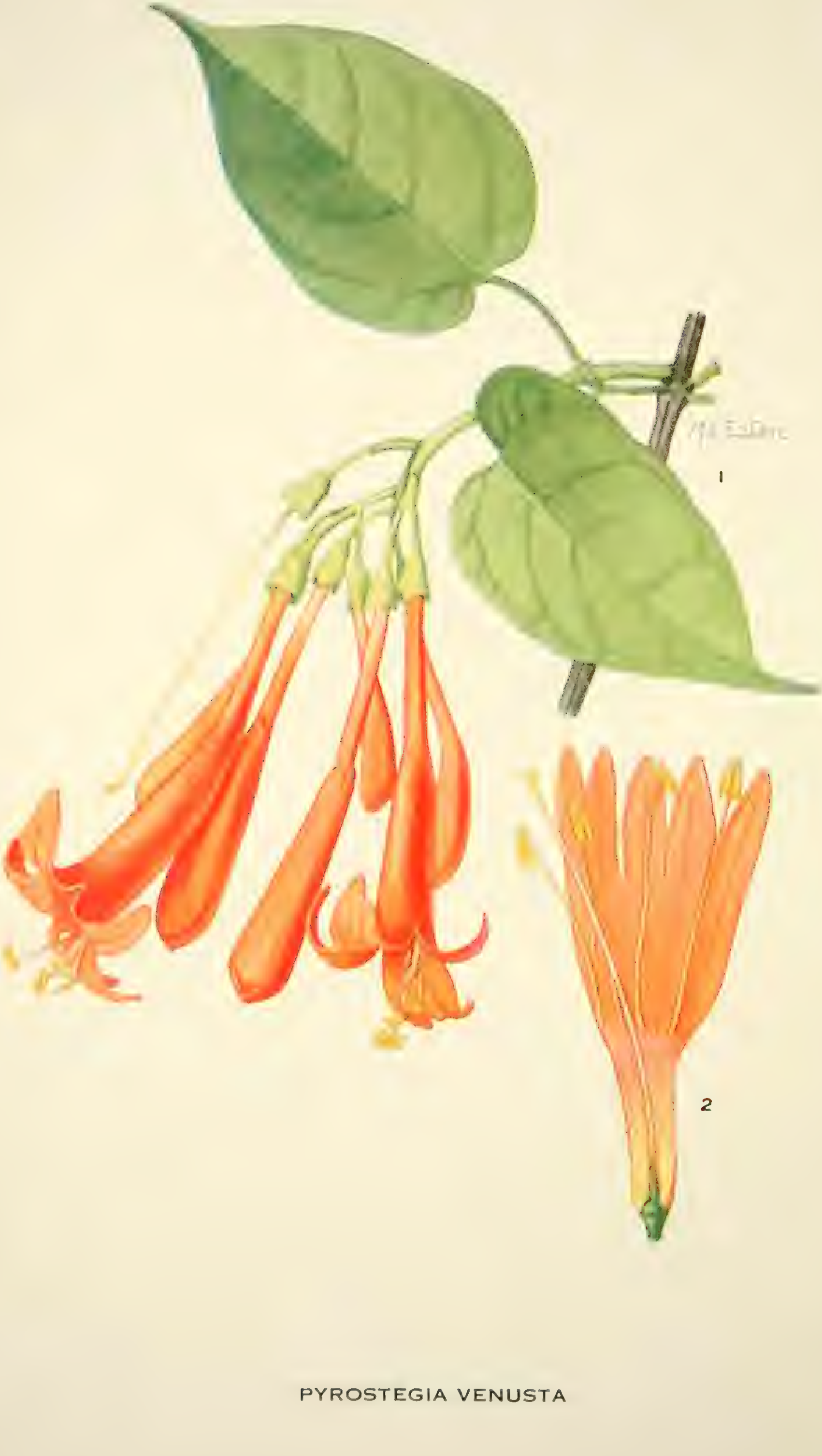
In May after flowering, prune or cut old specimens back. Keep growing, watering partially again until October, then feed and prepare for renewed flowering.

Potted plants may be plunged out during the duration of the summer season, to be taken indoors in September to a cool house.

The Wattle is easily propagated by sowing fresh seeds, which may be soaked in warm water for twenty-four hours, and by taking cuttings from slightly woody shoots about the month of June. These should be from the shorter side shoots, about two to four inches long, or somewhat longer from plants grown in vine-like fashion. Keep in propagating case, or under a bell-jar, in sand, or in peat and sand half and half.

The pearl Acacia is a tall shrub, covered with glaucous-grey, soft, felty pubescence, so that the plants are nearly white throughout when young. The phyllodes are leaf-like, alternate, ovate or oblong, more than half as broad as long, penni-nerved, with excentric midrib, apiculate point, and ciliate margin. On the upper edge, less than half way to the center of each phyllode is a gland. The flowers are in racemes of globular heads in the upper axils of the phyllodes, and usually a large raceme is terminal. The blooms are small, with calyx much shorter than the corolla. The petals are pubescent, yellow, with a prominent midrib. The fruit is a flat, oblong pod about two or three inches long, glaucous, felty and splitting all around the margin.

EXPLANATION OF PLATE. **Fig. 1.—Flowering branch. Fig. 2.—Flower. Fig. 3.—Style. Fig. 4.—Fruit.**



PYROSTEGIA VENUSTA

(Plate 542)

PYROSTEGIA VENUSTA

Trumpet-flower

Native of Brazil

Family BIGNONIACEAE TRUMPET-CREEPER Family

Bignonia venusta Ker, Bot. Reg. *pl. 249.* 1817.
Bignonia ignea Vell. Fl. Flumin. 244. 1825.
Pyrostegia ignea Presl, Bot. Bemerk. 93. 1844.
Pyrostegia venusta Baill. Hist. Pl. **10**: 31. 1888.

To many the name trumpet-flower brings back as haunting memories of tropical countries the glaring heat of the mid-day sun, seemingly intensified by great masses of flame-color which hang from high-climbing vines; the never-ceasing drone of insects, or the whirr of humming-bird's wings as they hover over and dart from flower to flower, for these flowers are especially adapted to their long beaks.

Bignoniads are among the most desirable and valued plants as greenhouse climbers, or for out-of-doors in the extreme south, as their easy culture and free flowering habit is unequalled in any other group of flowers. They are all brilliantly colored and make splendid displays of bloom, but usually need considerable space to show their gorgeousness to perfection. When grown in conservatories, trumpet-flowers should not be subjected to over-hot, moist or shaded conditions, but kept in a warm, sunny, well-lit house with only moderate moisture. The plants strike root easily from cuttings, and should be grown in a rich loamy soil. When four or five years of age, if they are well pruned and allowed to grow a season, they reward us well with great weaths of flame-colored bloom hanging down from the rafters over which the vines should be trained.

It is quite a common sight in the American tropics to see high stone walls, buildings and tall trees completely smothered in the showers of flame that are the flowers of this glorious plant, over and around which hover thousands of winged visitors.

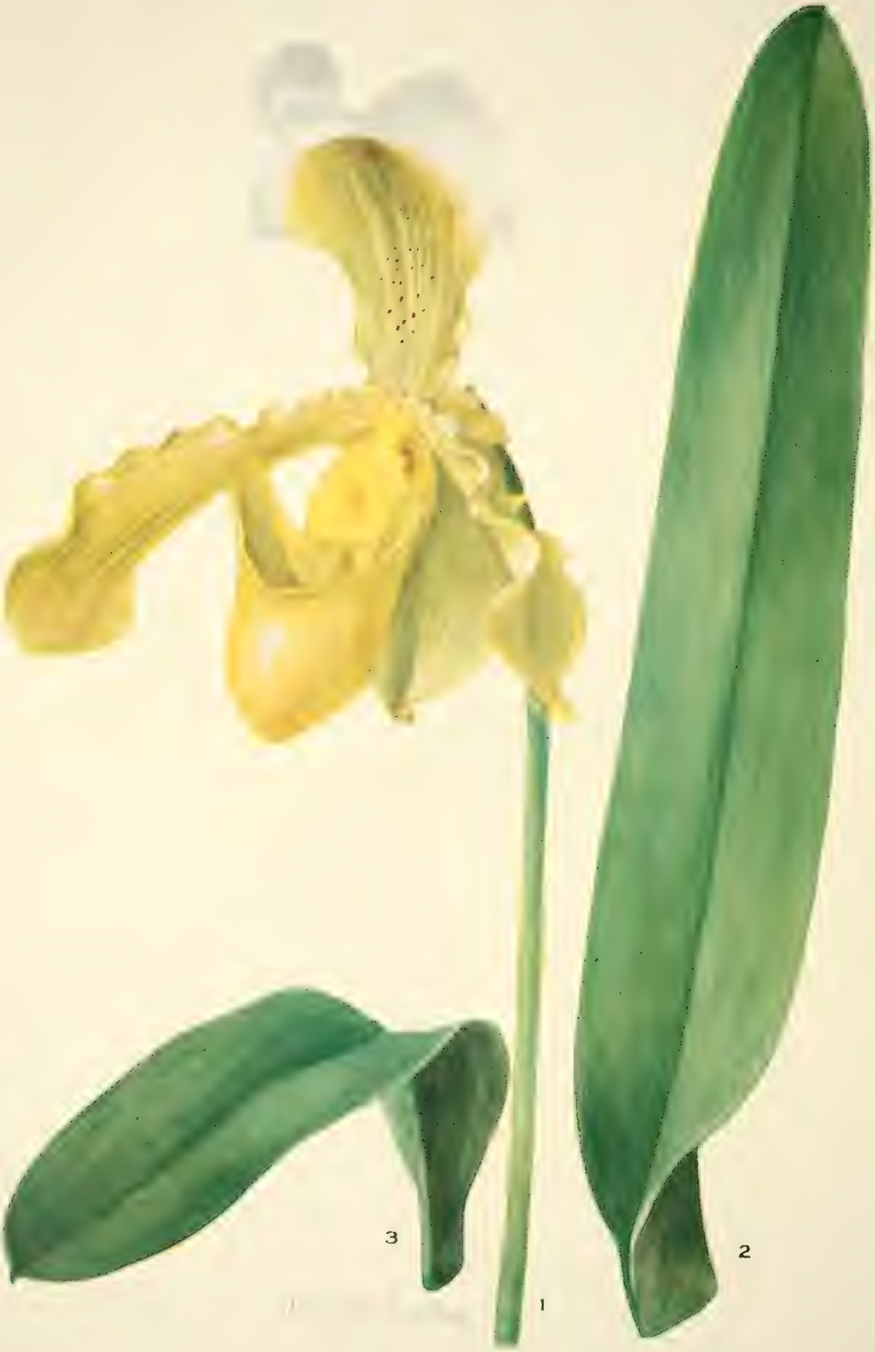
Pyrostegia comes from the two Greek words for fire and roof, in reference to the color of its flowers and the shape of the upper lip.

The species here illustrated is native in Brazil, but is extensively cultivated in the tropics.

The trumpet-flower is an evergreen, climbing shrub, with reddish brown bark and numerous branches. The leaves are compound, consisting of two two- to three-inch-long, ovate-acuminate, deep green, entire leaflets, with semi-cordate base and slender petiolules. The third or terminal leaflet is replaced by a filiform, three parted tendril which aids the plant in climbing. The third leaflet is present on the lower leaves, while the leaves subtending the inflorescence have neither leaflet nor tendril. The flowers are borne in terminal panicles of from four to twenty-five flowers each, a well grown plant having from three thousand upwards of these clusters, which bloom in mid-winter. The calyx is tubular-campanulate, nearly truncate or very shallowly lobed, green, and lightly leathery in texture. The corolla is brilliant orange or flame-color, tubular-funnel-form, curved, two to three inches long, the inch-long tube hairy within. The limb is five parted, the lobes valvate in bud, somewhat two-lipped, the two which form the upper lip upright and only slightly recurved, the three lower spreading and widely separated from the upper lip and from each other. The four stamens are exserted, the filaments adnate to the top of the tube, the anthers didymous. The gynoecium is about as long as the stamens, the stigma two-parted, the style white, filiform, the ovary linear with an annular disk. The fruit is a long, linear, flattened pod, with leathery valves. The seeds are elliptic and winged, arranged in two rows.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. **Fig. 1.—Flower-spray and leaf. Fig. 2.—Corolla laid open, showing androecium and gynoecium.**



PAPHIOPEDILUM INSIGNE SANDERAE

(Plate 543)

PAPHIOPEDILUM INSIGNE SANDERAE

Mrs. Sander's Venus-slipper

Horticultural Origin

Family ORCHIDACEAE ORCHID Family

Cypripedium insigne Sanderae Hort.
Paphiopedilum insigne Sanderae Hort.

The tropical Old World greenhouse orchids of the Lady-slipper group have been separated in horticultural literature as members of the genus *Paphiopedilum* and called Venus-slippers. The late Geo. V. Nash, a distinguished orchid expert, placed them under this genus in the Encyclopaedia of American Horticulture, Bailey. Later authors have retained Rafinesque's genus *Cordula* for them. By growers and gardeners they are still called *Cypripedium,* along with native North American (and Chinese and Japanese) Lady's-slippers, which more properly belong to this genus. The species number about fifty, but the varieties are considerable in extent.

The Venus-slipper *P. Insigne* is one of the oldest and most interesting of all cultivated orchids, and the variety *Sanderae* has been admired for the color which is brighter than that of most kinds of this class of orchids. It is a very floriferous plant, and adapted for growing in pots, pans, or baskets, and for the amateur fancier to begin with.

The whole stock of *Sanderae* probably came from one plant which was found about 1888 in the *insigne* collection of the famous English orchid growers, the Messrs. Sanders. The original plant was first cut in half, one part going to the Baron Schröder collection, where it was allowed to increase in size but was not divided; the other half was again divided into several parts and distributed to other growers for rapid propagation. The first plants shown in America were in the collection of Mr. F. L. Ames, of North Easton, Massachusetts. Another very fine specimen was exhibited from the famous collection of C. G. Roebling, of Trenton, N. J., in his 1894 importation of the Edwin Lonsdale orchids.

Often plants have from fifteen to twenty flower-stalks each, and the uniform clear yellow blooms, with nearly all-white dorsal sepals are not only prized for cut-flowers, but also especially for filling the benches of small conservatories or entire houses with free-flowering plants for special shows. The foliage, stalks and flowers combine impressively when massed, and no supplementary plants are needed in such displays.

These are orchids having no pseudobulbs. Through cross-fertilization seeds are usually obtained, and germination is perhaps easier than for most other orchids.

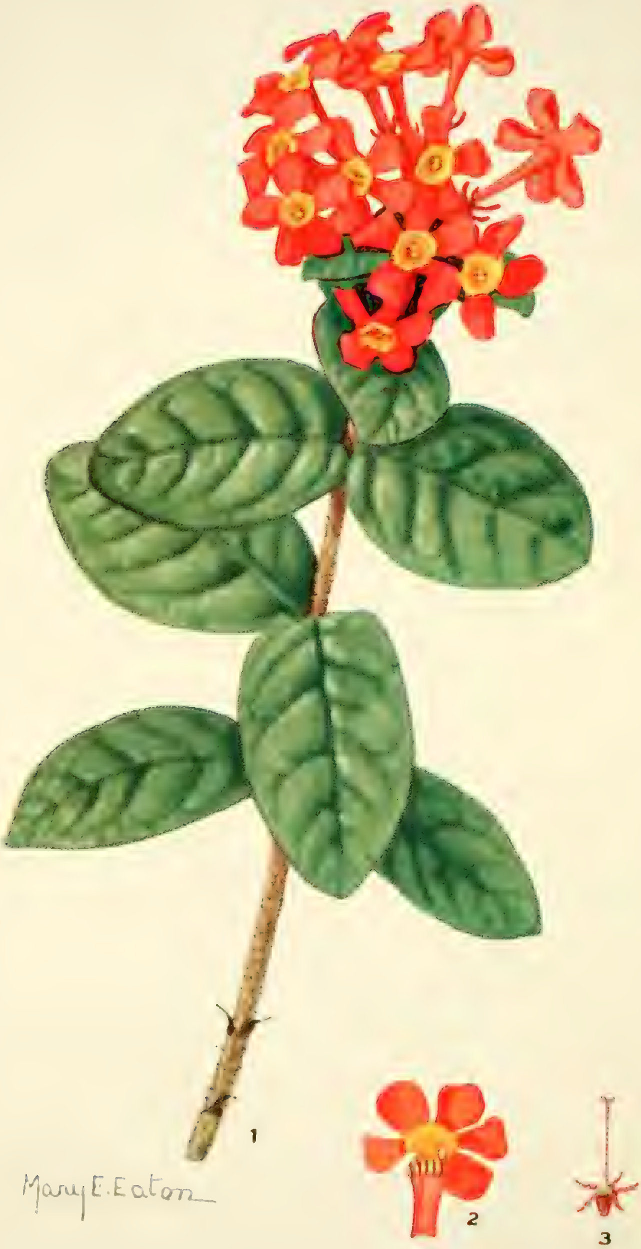
All of the Venus-slipper group stand little disturbance at the roots, but need reasonably large pots in proportion to the size some others may be confined in. The roots of these orchids do not do well when exposed to the air; they like to get beneath the compost they are planted in; therefore they do better if planted in pots or pans rather than on hanging slabs or in baskets.

They are grown in fern-root, broken charcoal, and sphagnum moss. The pot should be well-drained to half of its depth, using pieces of broken pots and large pieces of charcoal, with a layer of charcoal over the drainage. In potting, the compost should be well worked in among the roots and around them, made firm, and watered carefully until the plants are established. When flowering they like a liberal supply of moisture.

Mrs. Sander's Venus-slipper is a terrestrial orchid with very short stems. The leaves and scape are pale green. The leaves are not netted with black lines, are narrow, thickish, three quarters of an inch broad and about one foot long. The flowers are usually one to a scape, with two sepals and two petals.

The dorsal sepal is erect, conspicuous, broadly oval in shape, a primrose-yellow in ground color with scattered small reddish brown dots and an upper margin of clear white. The petals are yellow, glossy and spreading, undulate, and oblong-linear, about as long as the dorsal sepal. The lower sepal is small, greenish yellow and inconspicuous. The lip is waxy-yellow, inflated, pouch- or slipper-shaped.

EXPLANATION OF PLATE. Fig. 1.—Scape with flower. Fig. 2.—Leaf. Fig. 3.—Leaf showing keeled base.



Mary E. Eaton

RONDELETIA ODORATA

(Plate 544)

RONDELETIA ODORATA

Sweet-scented Rondeletia

Native of Cuba and Panama

Family RUBIACEAE MADDER Family

Rondeletia odorata Jacq. Enum. Pl. Carib. 18. 1760.
Rondeletia speciosa Lodd. Bot. Cab. *pl. 1893.* 1832.

There are numerous species of *Rondeletia* known, the majority of which are white or pink flowered, but the present subject is the most beautiful and brilliant-flowered of the genus and is a truly aristocratic plant for conservatory adornment. A well-grown specimen is unique for splendor and gives character to any exhibition in which it may be placed. Being of slow growth, it takes more time and space to reach perfection than many plant cultivators care to give it, and is therefore not so well-known in collections as it deserves to be.

The plants may be propagated by cuttings, taken preferably in the spring from the half-ripened wood, rooted in a mixture of peat and sand, and kept in a temperature of from sixty to seventy degrees, shaded from the sun and thoroughly watered. When rooted they should be potted in fern root siftings mixed with some sand, or fibrous peat may be used instead. Continued repotting with the addition to the peat of good fibrous loam until the plants have reached the size of an eight-inch pot, when they may go two seasons without repotting, if fed with liquid manure. When the flower buds show color, if the manure is withheld the flowers will last longer.

The species here illustrated was discovered in Cuba, near Havana, growing on bush-covered rocks near the sea, and occasionally on the bare rock itself. While in its native habitat it is extremely fragrant, it does not seem to develop this fragrance so strongly in greenhouse cultivation.

The genus *Rondeletia* was named after William Rondelet, a French physician and naturalist of the sixteenth century.

The variety *major* with larger flowers than the type is the usual cultivated form. A smaller-flowered variety is also known.

The sweet-scented Rondeletia is a rather straggling shrub up to six feet in height. The leaves are opposite, short petioled, the blades ovate to oblong, often with revolute margins, scabrous and lustrous, deep green above, less pubescent and paler beneath, thickcoriaceous; the brown stipules are triangular, persistent. The flowers are borne in ten- to thirty-flowered terminal cymes. The hypanthium is densely pilose. The five calyx-lobes are linear, obtuse, and erect. The corolla is bright orange-red, finely pubescent without, the throat bright yellow; the slender tube is about an inch long, the limb about a half-inch across, the lobes rounded, usually five in number. The five stamens are adnate in the throat of, and included in the corolla-tube. The pistil is nearly as long as the tube, the stigma two-cleft. The fruit is a two-celled globose capsule, crowned by the calyx, apically dehiscent into two valves, densely short-pilose. The seeds are numerous, angulate and yellow.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. **Fig. 1.—Flowering branch. Fig. 2.—Corolla laid open, showing stamens. Fig. 3.—Gynoecium and calyx.**

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